JUN 19 1923

THE INDUSTRIAL-ARTS MAGAZINE

JULY, 1923

THE BRUCE PUBLISHING COMPANY
MILWAUKEE . WISCONSIN

ATKINS SILVER STEEL SAWS

A Saw Message To Instructors and Supervisors

The saws illustrated on this page represent only a small part of our line. In addition to *Hand, Rip* and *Panel* Saws, we manufacture the following:—

Back Saws	Band Saws
Circular Saws	Coping Saws
Compass Saws	Concave Saws
Cross Cut Saws	Cut-off Saws
Dado Heads	Groover Saws
Flooring Saws	Hack Saws
Frames for Hack Saws	Higley Saws
Mitre Saws	Matcher Cutters

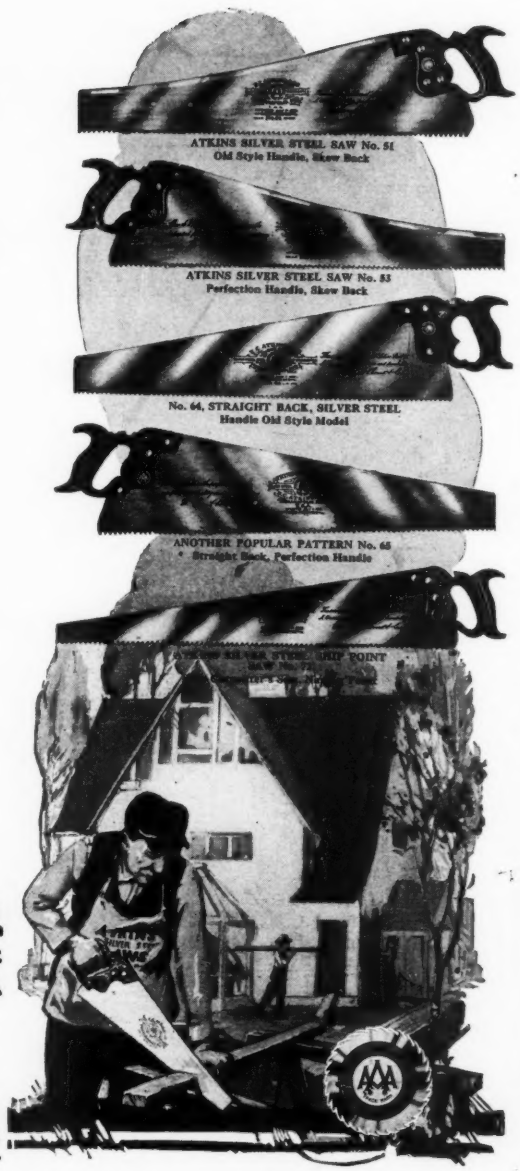
Machine Knives of all kinds

Metal Cutting Saws for all makes of machines.

Metal Cutting Machines, Swages, Shapers and other Saw Tools

Write today for literature descriptive of our complete line. Specify ATKINS products and get the best.

Ask for "Saw Sense," "How To Care For And Use Cross Cut And Hand Saws," also "Saw Fitting For Best Results."


ATKINS SILVER STEEL SAW No. 51
Old Style Handle, Skew Back
ATKINS SILVER STEEL SAW No. 53
Perfection Handle, Skew Back
No. 64, STRAIGHT BACK, SILVER STEEL
Handle Old Style Model
ANOTHER POPULAR PATTERN No. 65
Straight Back, Perfection Handle

E.C. ATKINS & CO.

ESTABLISHED 1857 THE SILVER STEEL SAW PEOPLE

Home Office and Factory, INDIANAPOLIS, INDIANA

Canadian Factory, Hamilton Ontario

Machine Knife Factory, Lancaster N.Y.

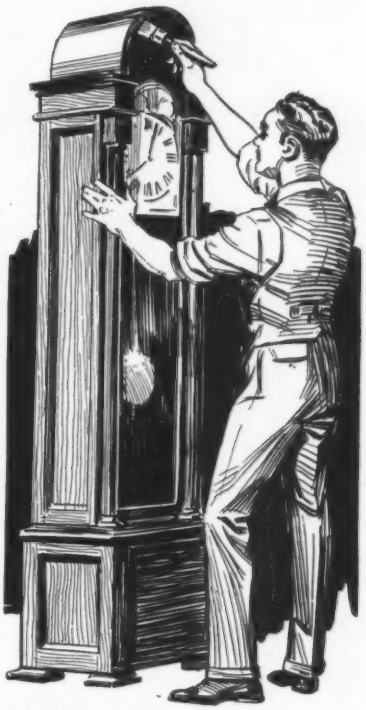
Branches Carrying Complete Stocks In The Following Cities:

Atlanta	New Orleans	Seattle
Memphis	New York City	Paris, France
Chicago	Portland, Ore.	Sydney, N. S. W.
Minneapolis	San Francisco	Vancouver, B.C.

Choosing the Proper Finish Is Important

Johnson's Artistic Wood Finishes are now being used in nine tenths of the schools in United States and Canada. They are particularly adapted for manual training work as they may be applied by the youngest and most inexperienced pupils with good results.

JOHNSON'S *ARTISTIC* WOOD FINISHES



The finishing of manual training models is assuming more and more importance every year. Surely it is a subject which should be given its share of attention, for a beautiful model may be ruined if improperly finished, whereas the defects of a poorly constructed model are minimized if well finished.

The finishes more popular among Training Instructors and Pupils are: Johnson's Wood Dye, Prepared Wax, Under Lac, Paste Wood Filler, Varnishes, Undercoat and Enamel.

Johnson's Artistic Wood Finishes are very easy to use. Boys in the Fifth and Sixth grades can use them successfully. Simple instructions are printed on every label.

FREE—Book on Wood Finishing

Our Book is a valuable text book on Wood Finishing and should be in the hands of every instructor of Industrial and Vocational Education. It is full of information on finishing all wood—hard or soft—old or new. Tells how inexpensive soft wood, such as pine, cypress, fir, etc., can be finished so they are beautiful as hardwood.

This Book is the work of experts — profusely illustrated in color — includes color charts — gives covering capacities, etc. New edition is just off the press. We will gladly send it free.

Submit Your Problems to Our Individual Service Department

We have a very attractive exhibit of wood panels finished with these products which we are glad to send, free and postpaid, to Manual Training instructors who will give it wall space in their shops.

At all times we are glad to furnish Manual Training Instructors with specially finished panels of wood for class room use, also with working samples. There is no obligation whatever connected with this offer. Don't hesitate to avail yourself of it.

S. C. JOHNSON & SON, Dept. I.A.-7, RACINE, WIS. (Canadian Factory — Brantford).

Please send me free and postpaid your text book on Wood Finishing. We usually buy finishing materials from

Dealer .....

My Name.....

My Address.....

City and State.....

Brass Bound
Mahogany Level
No. 1224
Price $7.

Mr. Punch says: *"Good work without a level is almost as impossible as good work without a square."*

To make students work more accurately

THAT'S what this Goodell-Pratt Level is for. Instead of finding the work a quarter or an eighth of an inch out of the way when the job is finished, the student will find the job plumbs up true all ways. And that's what makes a real craftsman.

Level is made of five pieces of thoroughly seasoned mahogany, with brass binding-plates dovetailed the entire length and doweled to heavy brass end-plates. Side views protected by brass plates.

The vial is accurately ground on the inside and is extremely sensitive. Set solid in the stock, as a double movable bar adjustment is used. Plumb glass has a similar adjustment.

Size 24 x 3 x 1¼ inches.

Other tools your school needs

In the Goodell-Pratt line of 1500 Good Tools are many that should be part of your school equipment now. Each tool is made by skilled toolsmiths.

Write for a copy of the Goodell-Pratt Catalog No. 15. It pictures and describes all the tools in which you are interested. It's free.

GOODELL-PRATT COMPANY

Toolsmiths

Greenfield, Mass., U. S. A.

GOODELL-PRATT

1500 GOOD TOOLS

WILLIAMS' "AGRIPPA" TOOL HOLDERS

"THE HOLDERS THAT HOLD"

Standard everywhere for all machining operations.

Designed for heavy cuts at high speeds, Williams' "AGRIPPA" Tool Holders have many unique features that make for convenience and economy. Add their prestige to your line.

Machinists' Tools Book on Request

J. H. WILLIAMS & CO.

"The Drop-Forging People"

BROOKLYN BUFFALO CHICAGO

MAYDOLE HAMMERS

THE WORLD'S STANDARD

There are none better made—none better known. When you buy these hammers, you are certain of getting the best. They are used the world over.

Maydole Hammers are made of finest quality material, and guaranteed first-class in every respect.

Write for our booklet of useful information, which every student should have. How many shall we send?

The David Maydole Hammer Company

NORWICH NEW YORK U. S. A.

A splendid carving tool set to start with —and to keep on with

Millers Falls Carving Tool Set No. 3 has tutored many an ambitious young mechanic, and helped him to get the hang of things.

Likewise it boasts many a lifelong friend among master workmen of the gouge and chisel.

This high quality set is made especially for manual training school use. It contains the following 12 tools:

"U" tool	Small circular gouge	Curved gouge
Veining tool	Small flat gouge	Large circular gouge
Narrow bevel chisel	Bent chisel	Large flat gouge
Narrow chisel	"V" tool	Wide chisel

Clips hold each tool firmly in place.

Forged steel blades, with keen cutting edges. Polished cocobolo handles. Polished and nickel-plated ferrules. Packed in hinged hardwood box.

Length of tools, except matting tool, average 8½ inches.

Instructors of Manual Training: Write us your needs.

MILLERS FALLS COMPANY
MILLERS FALLS, MASS.

Manufacturers of Carpenters' Tools, Hack Saws and Automobile Tools.

SIMONDS SAWS

Expert Mechanics and finest crucible steel make Simonds Saws the best that can be found. Whether it be Band, Circular or Hand Saws you require for the school shop, you will save money and get better results if you equip with Simonds.

Write for catalog and prices

Simonds Saw and Steel Co.

"The Saw Makers"

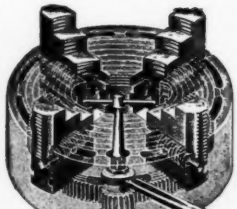
Fitchburg, Mass.
5 Factories

Chicago, Ill.
12 Branches

DURABILITY — ACCURACY — STRENGTH

are striking features of

Westcott Chucks



Spur Geared Scroll Combination Lathe Chuck

They are as essential in the schoolroom as in the commercial shop. The student who learns his trade using the very best of tools and equipment, is sure to benefit in the end.

In the case of chucks—
BUY WESTCOTT

Mainly About Your Classes

Little Giant Double Grip Drill Chuck

If you are not using Westcott Chucks now, you should certainly give your boys this advantage. Their best work can only be accomplished on the best equipment. Specify Westcott Chucks on your next order—in the meantime send for our catalogue.

Manufacturers of chucks for every class of work.

WESTCOTT CHUCK COMPANY

Oneida, New York

TRADE MARK

"STAR"
Hack Saws

Want the Best?

TRY IT

CLEMSON BROS., Inc.
MIDDLETOWN, N. Y.
Makers Since 1883

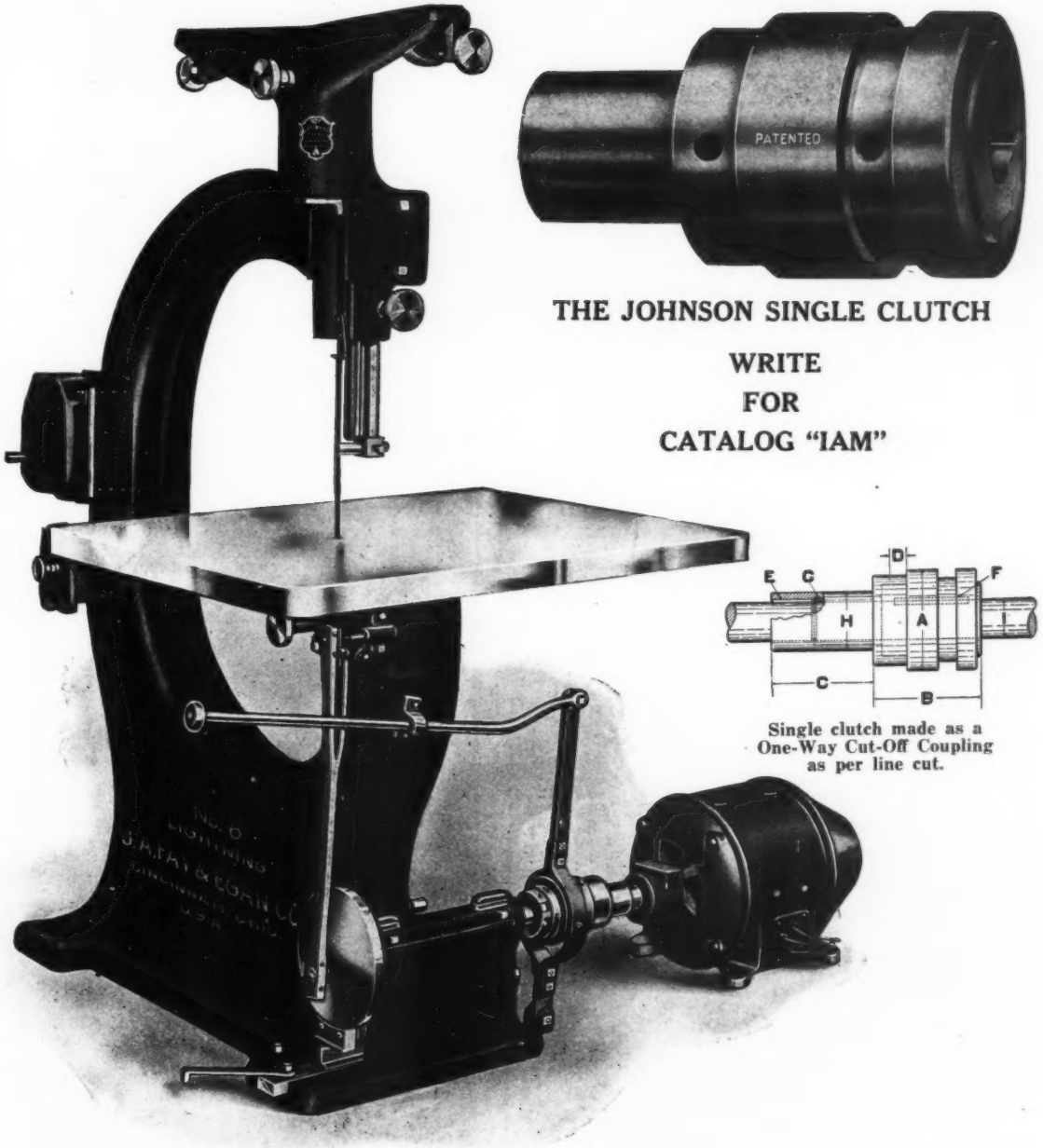
THE JOHNSON FRICTION CLUTCH

as used in the Manual Training Departments of

TECHNICAL HIGH SCHOOLS AND UNIVERSITIES

ON

A No. 6 Lightning Scroll Saw



THE JOHNSON SINGLE CLUTCH

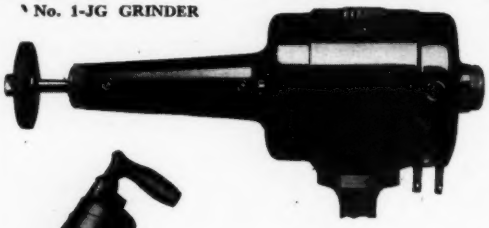
WRITE
FOR
CATALOG "IAM"

Single clutch made as a
One-Way Cut-Off Coupling
as per line cut.

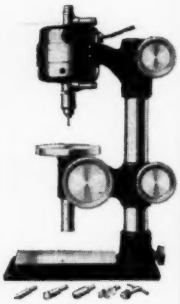
Courtesy: The J. A. Fay & Egan Co.
Cincinnati, Ohio.

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN.

No. 1-JG GRINDER



Model
1-BD DRILL



PRECISION DRILL

BUILT TO ENDURE

WE don't recommend abusing tools—but the tools we build will stand abuse. Pictured here are three DUMORE products that will perform satisfactorily under the guidance of even the most inexpert student. Equipping your workroom with any one or all of these sturdy, full-size tools means a permanent, trouble-free solution of all your grinding and drilling problems.

If you are not already equipped with high-speed portable grinders and motor driven drills—or if you plan to change from the type you are now using, we have some real facts to tell you about the qualities that make DUMORE tools so desirable for trade-school use.

Wisconsin Electric Company
6460 16th St., Racine, Wis.

V&B Braces

Do you have trouble with your end screw attachment? V & B Braces, with their patented key construction, make such troubles a thing of the past. A quality tool, of course!

VAUGHAN & BUSHNELL MANUFACTURING COMPANY
Makers of Fine Tools
2114 Carroll Ave. Chicago, Ill. U.S.A.

JOHNSON Combination Bench Furnace

**Quick Acting
Time and Gas
Saver
Requires No
Forced Air Blast**

No. 118

A Combination Bench Furnace for soldering, heat-treating or metal melting.
Firebox 6¼ x 5 x 6½ inches.
Fitted with three Powerful Johnson Atmospheric Burners, with shut-off valves and pilot lights.
This furnace has proven the most efficient general purpose Bench Furnace.

Send today for our illustrated booklet of Gas Appliances; shows temperatures, colors, etc.

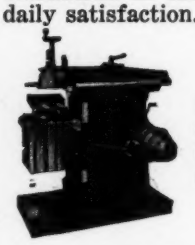
JOHNSON GAS APPLIANCE CO.
Cedar Rapids IOWA

Pacific Coast Representative
C. B. Babcock Co., 768 Mission St., San Francisco, Calif.

SHAPERS MILLERS ENGINE LATHES

14"x6'—$400.00
16"x6'— 450.00
With Quick Change Gear Box
$85.00 extra

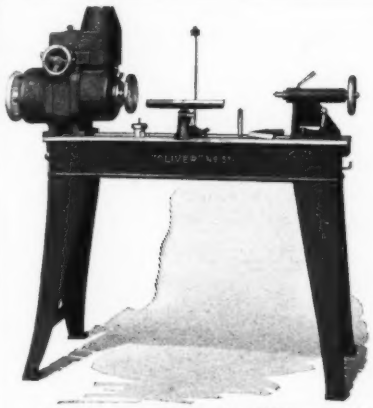
Moderate price machine tools — practically fool proof — ideally suited for school shops. Thousands in use all over the world giving daily satisfaction.



Descriptive catalogue and full particulars furnished upon request.

Industrial Education Department

THE JOHN STEPTOE CO.
CINCINNATI :: :: OHIO



There are 74 of the "Oliver" Adjustable Speed Motor Head Lathes in the Minneapolis Schools operating on Alternating Current. Consult the authorities there regarding performance.

Oliver Machinery Co.
Grand Rapids
Michigan
U. S. A.

"Oliver" Speed Lathes

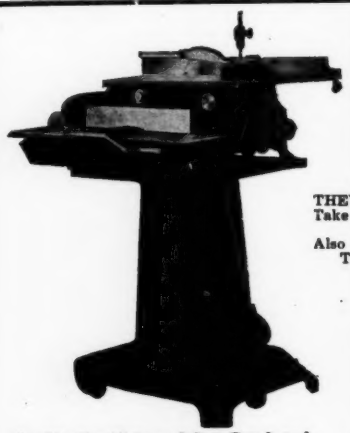
Still in the Lead.

The first Motor Head Speed Lathes were the "Oliver" Direct Current Speed Lathes. They were highly successful —sold very widely and are still doing business. Four Speed Headstocks for two and three phase Alternating Current were next developed but they were not as flexible as the older Direct Current Lathes, their speeds being unfortunately fixed at 570, 1140, 1725 and 3450 R.P.M.

To obtain complete flexibility for Alternating Current the "Oliver" Adjustable Speed Motor Headstock was developed for Alternating Current. It is the only headstock that will give complete range of speeds on Alternating Current, and the only adjustable speed motor headstock that will operate on single phase current.

May we send details?

UNION PORTABLE



Combination Universal Saw Bench and Six Inch Jointer

6" Jointer
16" Band Saw
Universal Saw Bench
Plain Saw Bench
4" Jointer
Single Spindle Shaper
Comb. Universal Saw and 6" Jointer

THEY ARE ON WHEELS
Take the machine to the job

Also Furnished As BENCH TYPE MACHINES.

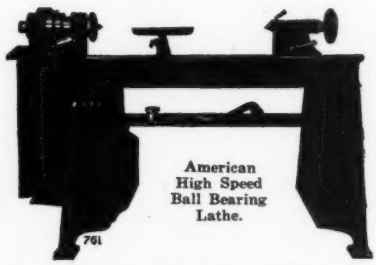
We recommend machines with the base which makes them conveniently portable.

All machines equipped with suitable motor with convenient switch to start or stop. Any lamp socket acts as your power supply line. Safety provisions have been taken care of to the absolute limit.

Send for Bulletin and Prices

GALLMEYER & LIVINGSTON CO.
SUCCESSORS TO UNION MACHINE CO.
20 Campau Avenue, N. W.,
GRAND RAPIDS MICHIGAN, U. S. A.

Make Your School-Shop *SAFE!*



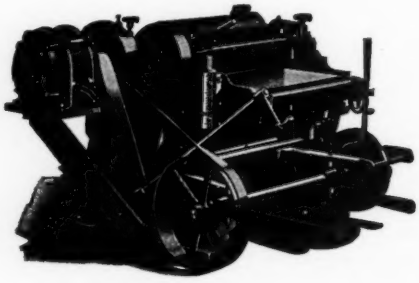
American High Speed Ball Bearing Lathe.

Note the wide margin of SAFETY this American High Speed Ball Bearing Lathe has over the usual lathe. It is designed to meet the demand for a "carelessness-proof" machine. The motor, drive pulleys and belt are inclosed. All hand shifting is eliminated by a sure one handle belt control and shifting device. There is a quick-acting emergency brake on the head stock. Not only unusually SAFE but unusually SURE. Any veteran shop foreman would delight in using this lathe because of its rugged simplicity and unerring "trueness." See to it that your vocational equipment is safe and sure. Write us today for complete specifications.

The same safe and sure standards are found in AMERICAN saw benches, jointers, planers, band saws and woodworkers.

American Saw Mill Machinery Company
74 Main St. Hackettstown, N. J.

AMERICAN
MANUAL TRAINING EQUIPMENT

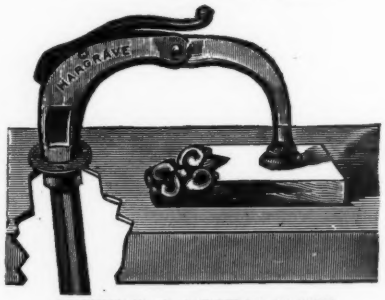


CRESCENT WOOD WORKING MACHINERY in your wood working department will give the same satisfactory service that the machines are delivering in thousands of factories throughout the world.

Send today for catalog of band saws, saw tables, jointers, borers, disk grinders, planers, planers and matchers, swing saws, cut off tables, shapers, mortisers, variety wood workers, universal wood workers.

The Crescent Machine Co.
25 Main Street
Leetonia, Ohio, U. S. A.

STANDARD CARRIAGE CLAMP.



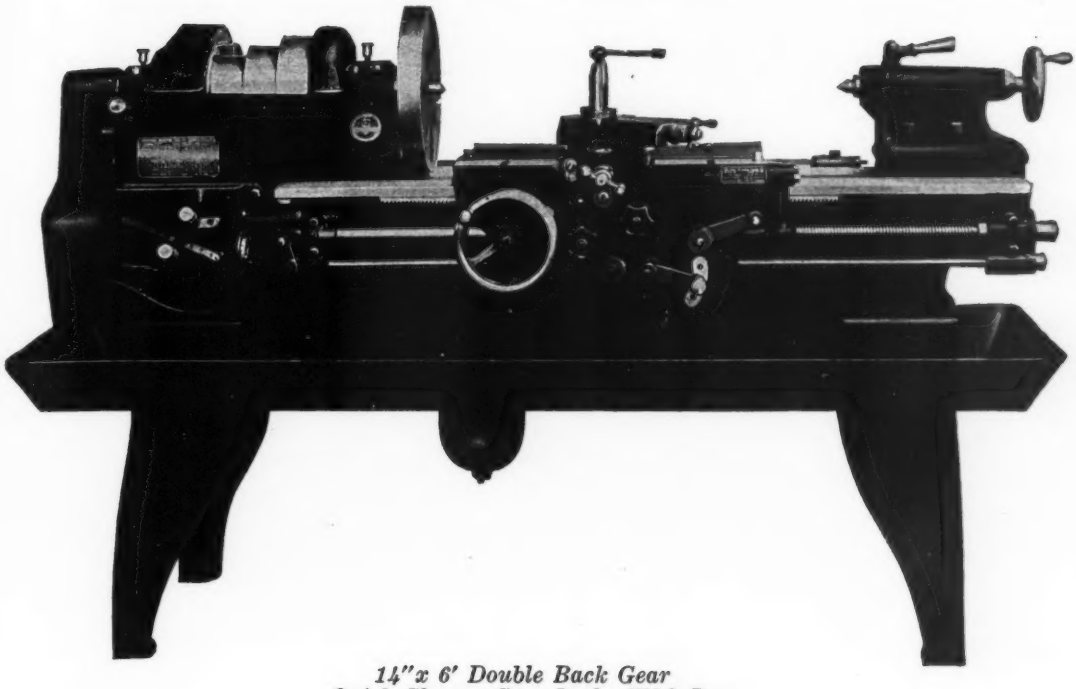
ADJUSTABLE CARVERS' CLAMP.

PERFECTION STEEL BAR CLAMP.

Send for catalog showing our complete line. A Clamp for every purpose and many other useful tools.

Ask your dealer for HARGRAVE QUALITY TOOLS

THE CINCINNATI TOOL CO.
Established 1879 Waverley Ave. and C. L. & N. Ry.
Incorporated 1884 CINCINNATI, OHIO



14"x 6' Double Back Gear
Quick Change Gear Lathe With Pan

More Monarch Lathes are being used in manufacturing plants throughout the country than any other make. More Monarch Lathes are being installed in Manual Training Departments of schools than any other make of lathe. The student, upon completion of his school work, will find himself coming in contact with Monarch Lathes in most shops.

Monarch Lathes are built in sizes ranging from 9 inch to 30 inch swing, and bed lengths from 2½′ to 30′.

Our Engineering Department will gladly submit plans and layouts for machine shop installations and we are in position to give Vocational Instructors valuable information and plans, for which no charge is made.

There is a Monarch Dealer near you, who will gladly show you the merits of Monarch Lathes.

Let us send you Special Vocational Bulletin.

THE MONARCH MACHINE TOOL CO.

304 OAK STREET SIDNEY, OHIO

Largest builders of high grade engine lathes and specialist in lathes for Vocational Training.

SEMI-STEEL CASTINGS

Parker Vises are cast in our own shops, a mixture of Bessemer Steel and Grey Iron that for 81 years has stood up under all kinds of shop work.

Handles that "Stay Put"

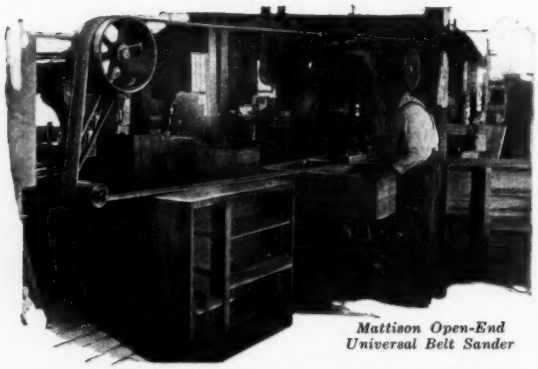
A set screw and spring holds the handle wherever placed, and also prevents it slipping down and pinching the student's hands.

Send for Parker Catalog No. 57-A

The Charles Parker Co.,
Master Vise Makers
Meriden, Conn., U. S. A.

PARKER VISES Grip Like a Grizzly

Sanding Assembled Cabinets With Hand-Block Sander



Mattison Open-End Universal Belt Sander

BESIDES providing a genuine machine method for sanding built-up cases, moulded shapes, etc., this Universal Belt Sander will give your boys an opportunity to familiarize themselves with mechanical sanding methods as they actually exist in practically every woodworking factory. If your school shop is not equipped with a Hand Block Belt Sander, you should immediately investigate this machine. We build three different models.

Bulletin 134 shows dozens of interesting operations. Ask for it.

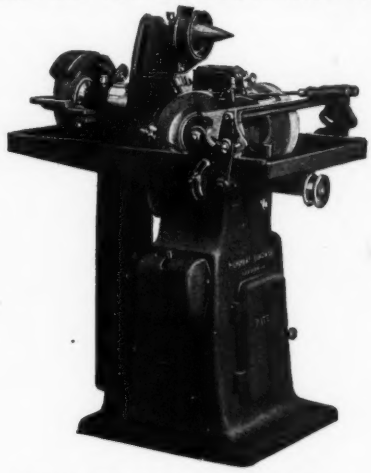
MATTISON MACHINE WORKS
Rockford, Illinois, U. S. A.

CHICAGO GREENSBORO, N. C. NEW YORK SAN FRANCISCO

MUMMERT-DIXON OILSTONE GRINDERS

The Modern Edge Tool Sharpening Machines

THE STANDARD FOR ALL INDUSTRIAL SCHOOLS



No. 481—Motor or Countershaft Drive.

An automatic attachment for grinding long knives can be furnished with this machine.

THE FIVE LEADING FEATURES

1. Coarse Oilstone Wheel
2. Fine Oilstone Wheel
3. Grinding Cone
4. Leather Wheel
5. Emery Wheel

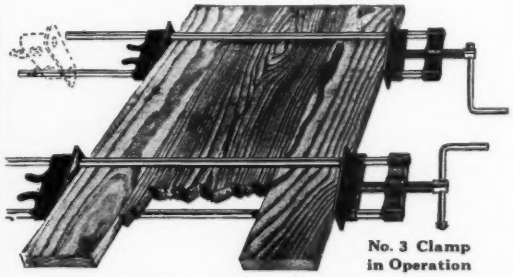
ALL AT YOUR FINGERS' ENDS

Send for full descriptive bulletin

MUMMERT-DIXON CO.
Hanover, Pa.

HARTFORD CLAMPS

are generally specified for shop use because they are the most efficient type of steel clamp obtainable. The No. 3 Double Bar Clamp can be quickly adjusted and is self-locking. The bar on each side of the wood maintains equal pressure and prevents disastrous buckling.



No. 3 Clamp in Operation

HARTFORD No. 6 Double Bar Clamps are also used extensively as presses—for veneering, glueing posts, chair arms, etc. The cost, however, is much less and the saving worth your consideration. Your first order will be followed by others on the basis of performance.

Send for Catalog No. 10, which contains complete price list on single and double bar clamps, hand screws and "C" Clamps.

HARTFORD CLAMP CO.
308 Pearl St. Hartford, Conn.

Final Date for Prize Essay Contest Extended to September 10th

A chance for teachers of woodworking or directors of vocational education having under their charge the woodworking or cabinet making departments to write their ideas during the vacation months

Many teachers have expressed the wish that instead of closing our prize essay contest June 1st, we extend it to September 10th in order that they might write their ideas during the vacation season.

This we are glad to do, for nothing shall stand in the way of gathering the greatest collection of ideas on the educational value of woodworking in the training of boys ever assembled.

So, you may write your essay during your vacation days, if you wish, but you must signify before July 1st your intention of doing so. If you are one of those who have already entered the contest and think that this extension of time gives you a chance to write a better essay we will accept another one from you.

Pestalozzi, Fröbel and Salamon, all stars of the first magnitude in the educational firmament. The two former laid stress on the education of the child in his tender years. The latter carried the same principles to the boy in the grades. Many of you are extending this influence in the high schools and colleges. Tell us, therefore, what you are doing or propose to do to perfect the great work of vocational education, particularly as it is applied to Cabinet Making or Woodworking.

American Woodworking Machinery Co.

Educational Department **Rochester, N. Y.**

Every eligible contestant will be rewarded for his effort with an elegant fountain pen valued at $6.00, and a series of cash prizes aggregating $10.000.00 is offered for the best essays.

For your information, we have prepared a folder giving complete details of the contest which we will send you immediately if you write for it.

CLASSIFIED WANTS DEPARTMENT

The rate for classified advertisements is $.07 per word per insertion, payable in advance. All wants subject to approval. Minimum 25 words. Forms close on 5th of the month preceding date of issue. Write for discount on yearly insertions.

APRONS.

Goodrick Student Aprons—size 29"x36"—brown, 60c; white, 50c. Instructor's apron gratis with first order of twelve or more. Shop coats, $4.90. Canvas Products Corporation, Fond du Lac, Wisconsin.

ART-GLASS

"Hard-To-Get" Materials—Pulls and Catches, Leg Sockets, Tea Wagon Wheels and Casters, Tray Handles, Costumer Hooks, Steel Rails for Wood Beds, Trays for Smoking Stands, Art Glass, Chair Cane, etc. Write for Catalog. Thurston Manual Training Supply Co., Anoka, Minnesota.

BASKETRY

Basketry Materials—We have everything for basket making, including reeds, willow, chair-cane, Indian splints, ash splints and wooden bases. Send Fifteen Cents for Samples, 65-page Catalogue and directions. This contains illustrations of over 500 baskets, trays, frames, etc., with suggestions as to making them. Louis Stoughton Drake, Inc., 33 Everett St., Allston, Boston 34, Mass.

Everything for Elementary Handwork — Also for basketry, weaving, bookbinding and chair caning. Mounting boards, Walderaft dyes, crayons, burlap, scissors, punch and eye sets. Thomas Charles Co., 2249 Calumet Ave., Chicago.

Basketry Material—Reed, Raffia, Bases, Pine Needles, Ash Splints, etc. Free Basketry Catalogues. J. L. Hammett Company, Cambridge, Mass.

Basketry—Pine needles, green, brown, 30c lb. Delayed payments 35c. Postage extra. Small cones 15c dozen. Baskets for sale, description and prices by correspondence. Florence Williamson, Culleoka, Tennessee.

BATIK

Manual Arts Supplies—Circular and straight knitters. Bookbinding Material, Bead Looms, Stencilling, Stick Printing and Batik Supplies, Wooden Napkin Rings, Plasticine, Flower Pot Moulds. Free Manual Arts Catalogues. J. L. Hammett Company, Cambridge, Mass.

BRUSH MAKING

Write for information on Brush Making in connection with your Special School and Manual Training Departments. Magnus Brush Materials, 604 West Lake Street, Chicago, Ill.

CABINET HARDWARE

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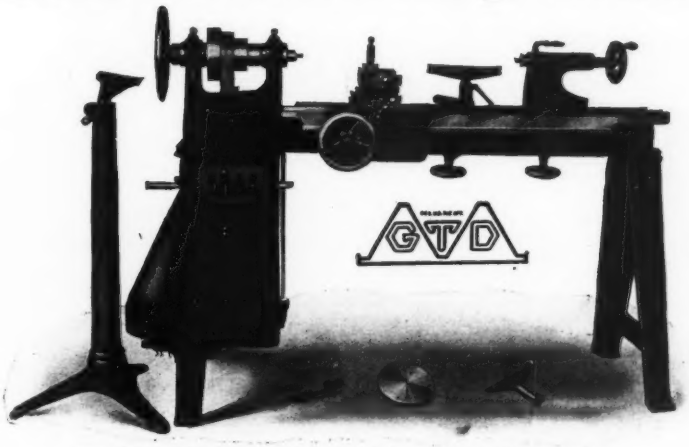

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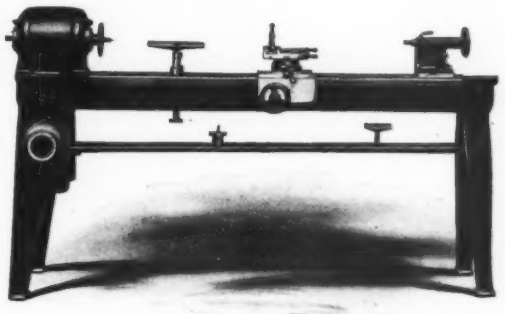

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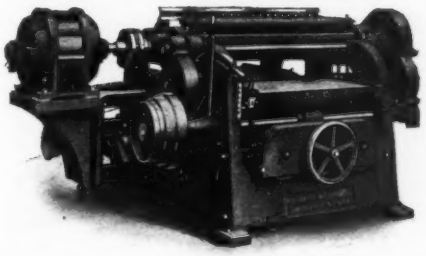

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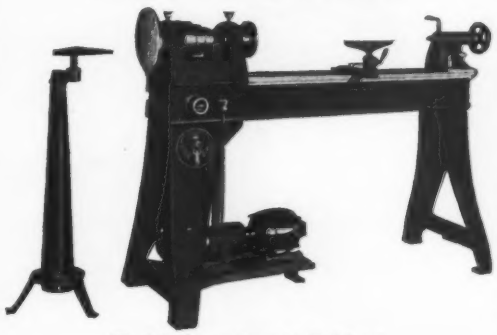

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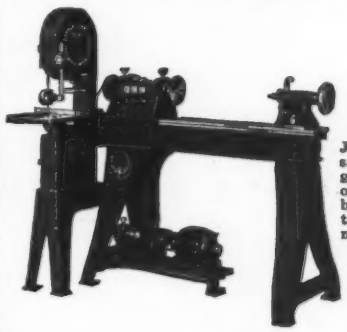

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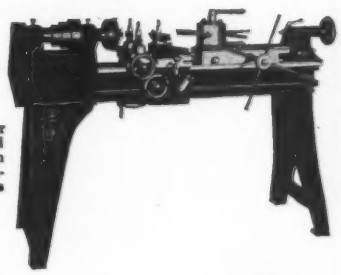

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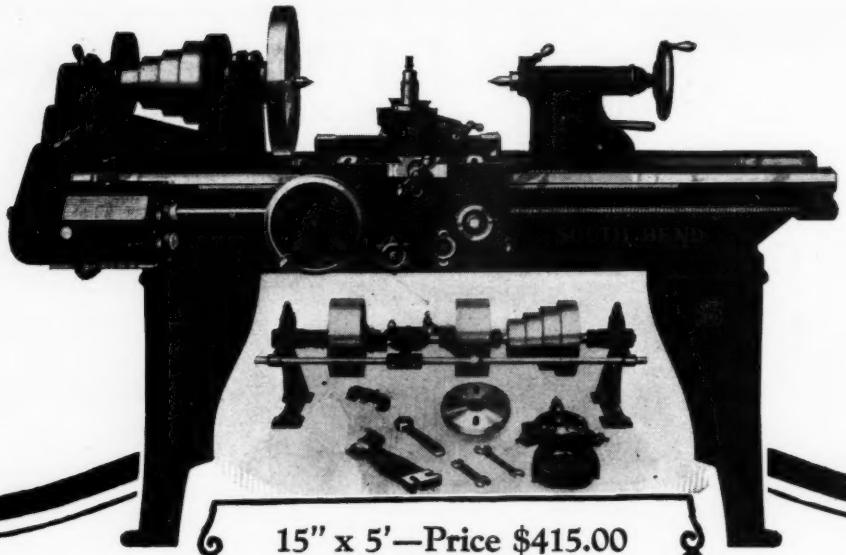

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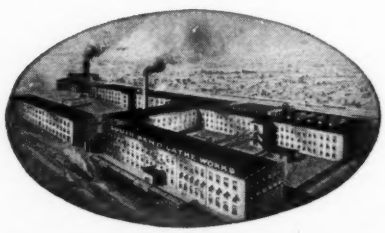

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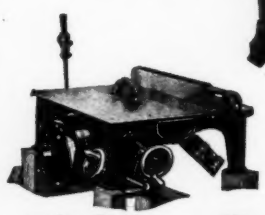

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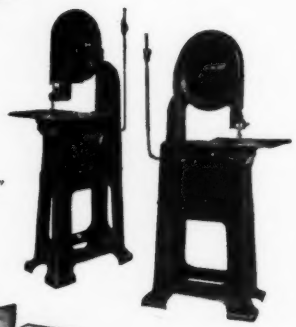

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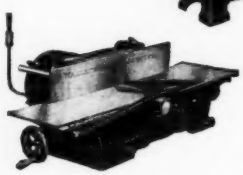

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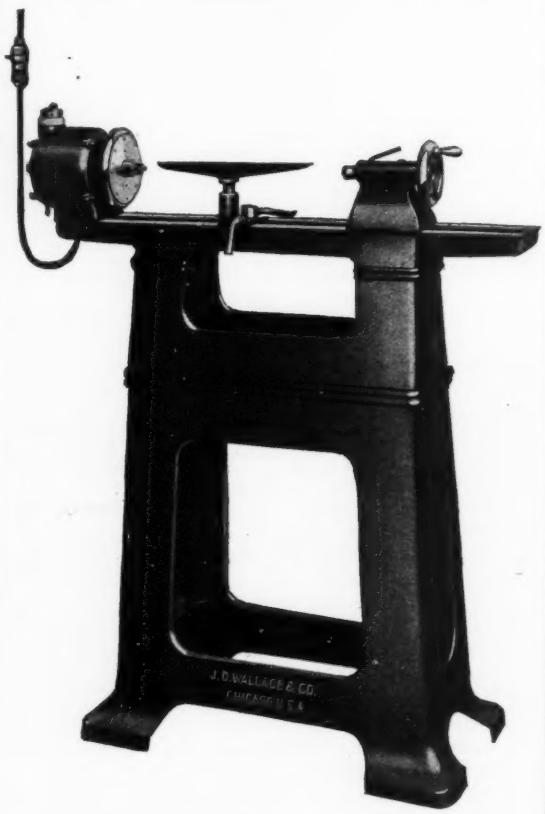

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INDUSTRIAL-ARTS MAGAZINE

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The Vocational Interests of Children

H. B. Alberty, Assistant Superintendent of Schools, Cuyahoga County, Ohio.

THE practical value of the conclusions which pupils in the upper grades of the elementary school and in the high school have reached as to their life work has long been an unsettled question. On the one hand, we have those who agree with Dr. Charles Eliot in the statement, "The motive of the life career should be brought into play as early as possible," and who believe that the teacher may effectively utilize this life career motive as a means of motivation. For example, if she knows that John expects to become a doctor, even though he may change his mind tomorrow, she may easily capitalize this knowledge by assigning to John, the special topic in civics, "community hygiene" or "the prevention of disease," and to James, who expects to become a lawyer, an investigation of the method of conducting a council meeting, or some topic related to court procedure. On the other hand, there are those who place no dependence, whatever, upon the assertions of pupils as to their life career and who do not believe that it is of value to know what these vocational interests are.

We must, however, bear in mind that within a comparatively short time most of the pupils now in the schools, will have taken their place in the wage-earning population with little or no conscious effort on the part of the school to be of assistance in that most fundamental problem of finding one's place in the world, or even to recognize that pupils' choices of occupation are of any value whatever. We must also bear in mind that any plan of educational guidance must take into consideration the future vocational plans of the individual.

The aims of this study are as follows:

1. To determine the extent to which pupils have selected some occupation, and to determine whether or not the percentage of pupils who have selected a vocation, increases from grade to grade.

2. To determine the influence of the occupations of the father, mother, brothers and sisters on the vocational choices of the pupils.

3. To determine the number of pupils in each district who expect to finish high school and to see whether or not the percentage of pupils who expect to finish high school increases from grade to grade.

4. To determine the number of pupils in each district and in each grade who expect to go to college and to see whether or not the percentage of pupils who expect to go to college increases from grade to grade.

5. To determine whether or not as many pupils expect to attend high school and college, from districts which have no high school of their own, but which pay the tuition of their pupils to other high schools, as expect to attend high school and college in districts which support a high school of their own.

6. To use these data in later studies on the permanence of these vocational interests and to establish, if possible, a real need for educational and vocational guidance.

The Cuyahoga County school district comprises about 350 square miles of territory, with a total population of 60,000 and a school population of about 11,000. The character of the various local districts ranges from the typical rural section to the residential and industrial sections adjoining the city of Cleveland. This study includes all of the pupils of grades seven to twelve, about three thousand in number. Among other questions concerning home study, outside activities, and likes or dislikes for the various school subjects, the following questions were asked:

1. What do you wish to do to earn your living when you have finished school?
Reasons for your choice.
3. Occupation of father
of mother (if employed)
of brothers (if employed)
of sisters (if employed)
4. Check the grade in school you expect to complete.
5. Do you expect to go to school beyond the high school (twelfth year)?

In order to keep the study under proper control, very careful instructions were given to the teacher who supervised the filling out of the cards. The teachers were asked not to assist pupils, except to make clear the meaning of the questions. This assistance was to be given without, even in a general way, suggesting the possible answers.

For purposes of tabulating, the general classifications of the U. S. Census Bureau were adhered to as closely as possible. The following classifications were used:

1. Agriculture
2. Extraction of minerals
3. Manufacturing
4. Transportation
5. Trade
6. Public service
7. Professional service
8. Domestic and personal service
9. Clerical occupations

Eight of the nine classifications are represented in the tabulations, the "extraction of minerals" being the only one not needed.

The following table is a comparison of the percentage of pupils who chose certain occupations, with the percentage of males in the United States engaged in the same occupation:

Occupational Classification	Per Cent in U. S. Males	Distribution 14th Census Females	Per Cent District in Cuyahoga Co. Schools Boys	Girls
1. Agriculture, forestry and animal husbandry	29.8	12.7	19.5	.5
2. Extraction of minerals	3.3	....	....	....
3. Manufacturing and mechanical industries	32.9	22.6	20.5	.5
4. Transportation	8.6	2.5	3.2	.4
5. Trade	10.8	7.8	7.4	3.1
6. Public service	2.3	.3	1.2	.06
7. Professional service	3.4	11.9	36.7	48.2
8. Domestic and Personal service	3.7	25.6	.06	8.1
9. Clerical occupations	5.1	16.7	2.4	9.6

It will be noted that by far, the largest percentage of boys (36.7 per cent), chose some form of professional service. Many of the pupils who have dropped out of school are, of course, engaged in the skilled and unskilled occupations. It is also true that many of the "professional service" group must be recruited from the high school. It is nevertheless probably true that there will be a great deal of shifting of choices.

It will be noted also that the largest percentage of girls (48.2 per cent), chose some form of professional service. This is no doubt partly accounted for by the fact that most of the teachers, who make up the largest part of this group (30.3 per cent) must come from the high schools and that many who will engage in domestic and personal service, agriculture, etc., have already dropped out of school.

The following occupations were selected by the boys: Engineering, 17.7 per cent; farming, 17.6 per cent; mechanics, 8.1 per cent; law, 5.1 per cent; medicine, 3 per cent; business, 2.7 per cent; carpentry, 2.6 per cent; electrical work, 2.6 per cent; machinist, 2.3 per cent; music, 1.9 per cent; drafting, 1.9 per cent; locomotive engineering, 1.6 per cent; salesmanship, 1.7 per cent; bookkeeping, 1.4 per cent; commercial art, 1.4 per cent; chemistry, 1 per cent; undecided, 9.9 per cent; total, 83.7 per cent.

The remaining 16.3 per cent chose the following occupations: Acting, anthropology, architecture, army and navy, art, baking, banking, barbering, baseball playing, bee-keeping, boat captain, boot-legging, butchering, clerking, contracting, cooking, dentistry, designing, detective work, pharmacy, factory work, fireman, floriculture, foreman, forestry, jeweler, journalism, laboring, magician, mail clerking, manufacturing, masonry, messenger service, ministry, missionary work, naturalist, office work, painting, printing, police service, public official, radio operating, railroad official, ranching, real estate, sailor, steam fitting, steeple jack, surveying, truck driving, teaching, and welfare work.

It is interesting to note the percentage of boys in each grade who selected one of the three leading occupations:

	Grades					
	7	8	9	10	11	12
Engineering	14.6	16.3	16.7	22.7	22.8	23.4
Agriculture	17.8	19.5	17.7	15.7	16.6	14.2
Mechanics	9.7	11.1	8.5	5.9	5.2	5.1
Undecided	5.9	6.4	13.9	11.8	8.7	18.3

Engineering seems to have an increasingly strong appeal from grade to grade. No doubt, the vast fund of knowledge gained in the study of general science, chemistry and physics has much to do with this tendency. Van Denberg, in an early study of high school pupils in the New York City schools, found also that engineering was the leading occupation. He partly accounted for this by the fact that large engineering operations were being carried on in New York at that time. This conclusion would not seem to be valid in Cuyahoga County.

Agriculture, as a vocation, seems to lose popularity from grade to grade, probably indicating that our high schools are educating away from the farm.

The following occupations were selected by the girls: Teaching, 30.3 per cent; stenography, 21.2 per cent; nursing, 8.2 per cent; dressmaking, 4.1 per cent; bookkeeping, 3.9 per cent; office work, 3.3 per cent; housework, 2.2 per cent; clerking, 2.1 per cent; music, 1.7 per cent; art, 1.5 per cent; journalism, 1.4 per cent; library work, 1 per cent; undecided, 9.6 per cent; total, 90.5 per cent. The remaining 9.5 per cent selected the following occupations: Acting, architecture, banking, business, chemistry, commercial art, cooking, decorating, designing, medicine, electrical work, factory work, farming, floriculture, hairdressing, law, millinery, missionary work, politics, printing, radio work, salesmanship, telephone operating and welfare work.

The percentage of girls of each grade who selected one of the three leading occupations is as follows:

	Grades					
	7	8	9	10	11	12
Teaching	29.9	24.8	30.9	32.	29.5	48
Stenography	18.2	24.5	22.4	19.1	26.7	22.1
Nursing	9	8.2	9.7	5.7	5.6	6.7
Undecided	7	9.3	9.7	18.5	9.8	5.7

Some studies have been made which tend to show that as a pupil advances in the grades, the desire to teach diminishes, due in some cases to guidance away from teaching by teachers and principals. In Cuyahoga County, the opposite appears to be the case. Teaching,

as a profession, increases steadily in popularity, as is evidenced by the fact that nearly half of the senior girls expect to teach. This is due, in part at least, to the more attractive salaries and better living and working conditions. Teaching is a much more inviting profession now than in the days when $40 per month was considered a good salary. If the conditions indicated in this study represent, even to a small degree, the sentiment of young people toward teaching as a life-work, it is safe to assume that within the next few years, there will be no shortage of teachers. It is rather interesting to note that 457 girls named teaching as their intended vocation, while only eleven boys indicated any desire to teach.

Only 9.9 per cent of the boys and 9.6 per cent of the girls failed to name a vocation which they expected to follow. The following is a comparison of this item with other studies of a similar nature.

Study	Percentage of Pupils Who Failed to Name Some Vocation. Boys	Girls
Cuyahoga Co. Grades 7-12, 1922.	9.9	9.6
New York City, 1,000 8th grade pupils. VanDenberg, 1906...	41.	55.
Cincinnati. Grades 7-12, McCracken, 1920	17.4	15.1
Indiana High Schools — 12th Grade, only. Book, 1922.....	36.	40

The percentage of pupils who chose the same occupation as the father, mother, brothers or sisters is as follows:

	Father	Mother	Brothers	Sisters
Boys	23.7	...	2.7	.06
Girls	4.	2.4	.7	5.8

The occupation of the father seems to influence the intended occupation of the boys to a much greater degree than that of the other members of the family, while in the case of the girls, the sisters' occupation seems to have the most influence.

The percentages of pupils who expect to finish high school and go to college are given below:

Percentages of pupils who expect to:

	Finish High School Boys	Girls	Go to College Boys	Girls
(1) 7th and 8th grades in districts which have no high school.....	68.	70.8	43.2	45.6
(2) 7th and 8th grades in districts which have a high school.....	79.5	83.5	57.9	67.7
(3) Grades 7 to 12 in districts which have a high school.....	85.4	88.	63.4	69.
(4) All schools of Cuyahoga County, 7th to 12th Grades.....	82.5	84.3	59.6	63.9
(5) Cincinnati Schools, 7th to 12th Grades.....	76.2	75.6	46.2	42.3

The influence of a high school in a district on the percentage of pupils who expect to finish is very noticeable. The seventh and eighth grades in districts which have high schools were tabulated separately in order to form a fair basis for comparison with the seventh and eighth grades in districts which do not have a high school, but which pay the tuition of their eighth grade graduates to high schools in other districts. The result as indicated in the above table shows a difference of 11.7 per cent in favor of the districts which have high schools. The same general condition seems to exist in regard to the expectation of going to college. Only 44.4 per cent of the seventh and eighth grade pupils in districts which have no high schools expect to go to college, while 62.8 per cent of the pupils of the seventh and eighth grades in districts which have a high school signify their intention of going to college. Apparently, a high school in a community in which the pupils live, has a marked effect upon the determination of the pupils to pursue their studies even beyond the high school.

Distribution by grades of pupils in Cuyahoga County who expect to finish high school and go to college:

Grade	Will Finish High School. Boys Pct.	Girls Pct.	Grade	Will Go to College. Boys Pct.	Girls Pct.
7th 72.6	78.8	7th 54.4	60.6
8th 78.5	80.4	8th 51.2	56.1
9th 82.5	87.1	9th 61.6	62.1
10th 93.1	92.1	10th 70.4	68.1
11th 98.4	97.8	11th 72.9	77.6
12th 99.1	98.9	12th 80.3	75.8

Apparently, "nothing succeeds like success," and as pupils advance from grade to grade, they catch the spirit and are more determined to finish. It is, of course, true, that elimination is an important factor because many of the "uncertain pupils" drop out of school in the eighth or ninth grade.

A study was made of the intelligence ratings on the Illinois Scale, of the pupils who selected the leading occupations. The following data shows the median and distribution of the seventh grade pupils in the two leading vocations:

	No. Cases	Total Range of Intelligence Quotients	Median I-Q
Boys			
Engineering	51	75-135	105
Agriculture	60	50-140	90
No. boys in group..	350	50-160	95
Girls			
Teaching	108	65-160	110
Stenography	69	75-145	100
No. girls in group..	363	50-160	100

These results are, of course, not at all conclusive, but seem to indicate a slight tendency for the boys of high mentality to favor engineering as a vocation and for the girls who rated fairly high to favor teaching.

While no positive conclusions may be drawn from this study, yet it would seem that teachers and school administrators should not neglect the opportunity of aiding the pupil in every way possible in the selection of a suitable life career. This may be done by the following means:

1. Try-out courses covering a wide range of occupational activities should be introduced.
2. Work in English composition should be so planned to give vocational assistance to the pupil.
3. A carefully selected list of books on vocational subjects should be placed in the library and special assistance along this line given by the librarian.

4. A course in occupational civics should be a part of every high school curriculum.

5. Successful men and women of various vocations should be invited to address the pupils on the advantages and opportunities in their vocations.

6. A systematic plan should be worked out which would have for its objective an analysis of the capabilities and capacities of the pupils, and the use of this knowledge in aiding the pupil to the selection of a more intelligent background for the selection of a life career.

Practical Methods of Block Printing

Robert F. Salade.

PRINTING from engraved wood blocks was done many centuries before the invention of movable, or separate, printing type. History tells that in the year 770 A. D., the Japanese Empress, Shiau-toku, gave an order for wood-block printing consisting of 1,000,000 copies of a verse from the Buddhist scriptures. This method of printing was slow but efficient. The surface of the engraved block was covered with ink; a sheet of dampened paper was laid on the block, and then the back of the sheet of paper was rubbed with the palm of the printer's hand, or with a rounded tool. By this action the inked inscription was transferred to the sheet of paper.

During the tenth century both the Japanese and Chinese produced a great deal of printed matter from wood blocks, including pictures and inscriptions, and some of this work was done in several different colors. In time the art spread to other parts of the world. In Europe, during the fifteenth century period, both sacred pictures and playing cards were printed from wood blocks. The oldest printed illustration of a known age is dated 1432, and it pictures the Infant Jesus being carried across a river by St. Christopher. Not long after this picture had been printed an unknown Dutch printer, of Holland, produced several complete books from engraved wood blocks, including illustrations and reading matter, and the lettering was so finely cut that it appears like printing done from movable type.

It was in the year 1455 that John Gutenberg, a citizen of Mainz, Germany, cast the first movable type, and with that type he set up and printed on a hand press his now famous "42-line bible," so called because most of the printed columns in it each contain 42 lines of text. Numerous copies of the bible are still in existence. Gutenberg's invention revolutionized the printing art, and later on made it possible to produce books, magazines and newspapers in unlimited quantities.

AN EXAMPLE OF A WOOD CUT MADE BY AN ADULT CRAFTSMAN.

LINOLEUM BLOCK PRINT BY STUDENTS OF PUBLIC SCHOOL No. 24, JERSEY CITY, N. J.

In these days only a very small amount of printing is being done from wood cuts, yet the art of block printing has always been followed to some extent ever since its beginning, and in recent years has been revived. The art of block printing is popular because it enables any person to make his or her own book plates, greeting cards, poster stamps, package seals, etc. By the same process designs for booklet and program covers may be produced. Certain kinds of block printing can also be utilized for stamping borders or other decorative marks on window curtains, parchment lamp shades, leather novelties, bureau scarfs and so on.

There are various methods of block printing, and the best results are obtained from engraved wood blocks on a regular printing press. However, good results may also be had from linoleum blocks, art gum, or potato blocks. In some cases the stamping can be done by hand, without the use of a press. In other instances the printing can be done with the aid of a letter-press, or even a cider press. It is said that John Fitch, inventor of the first steamboat, printed an early map of the State of Ohio on an old cider press.

The early wood-cut engravers were masters of their art, and even at the present time beautiful pictures are being engraved on wood by skilled artists. But, as wood engraving is difficult for the average person, linoleum, art gum, or potatoes may be used instead of wood.

For printing a quantity of book plates, greeting cards, poster stamps or package seals, a linoleum block will be found most practicable, and it may be used for hundreds of impressions without showing wear. Purchase an odd piece of Grade A battleship linoleum, and with a sharp knife cut it to the sizes required. The cut piece of linoleum should be glued to a plain block of wood about 13/16 of an inch high. This will make the complete block near the standard height of printers' type, and would make it possible to print from the block on a regular printing press.

The first step is to make the original drawing for the subject that is to be cut, and the drawing should be the exact size of the design to be cut. The drawing should consist of heavy, solid masses rather than fine lines, as the fine lines are hard to duplicate in hand cutting. After the original drawing has been finished, spread over it a sheet of thin transparent paper, like glassine paper, for example, and with a hard black pencil trace a reproduction of the original on the transparent paper. This pencil tracing is then to be pasted *upside* down on the surface of the linoleum to be engraved. The idea is to cut the subject backwards, or in reverse of the original, so that it will be like the original when printed. The transparent paper on the block plainly shows the lines where the cutting is to be done. Only the "white" places in the drawing are to be cut out from the linoleum. The black parts of the sketch are to remain for printing. The cut away portions will show white, or blank, in the printing. The cutting must be carefully done with a very sharp knife. A pen-knife with small pointed blades will be excellent for the work. Cut the lines on a slant leading slightly away from the parts that are to remain uncut, and cut clean through the linoleum until the surface of the wood block is reached. The cut out portions are to be removed and thrown away. The success of the whole operation depends upon accurate, clean and sharp cutting. Practice makes perfect.

BOOK ILLUSTRATION CUT FROM A LINOLEUM BLOCK BY F. W. SCHAEFER, NEW YORK CITY. (Reduced Slightly.)

LINOLEUM BLOCK PRINTING DONE IN THREE COLORS BY STUDENTS OF PUBLIC SCHOOL No. 24, JERSEY CITY, N. J.

After the linoleum has been properly cut, the pieces of tracing paper are sponged off, and then the block is ready for printing. Obtain from a commercial printer a small supply of job printing ink, which is thick and "sticky," but which is just the thing for the purpose. Printers' ink comes in black and all colors. The ink should be applied to the surface of the block with a small hand printers' roller. Place some of the ink on a sheet of old cardboard, and manipulate it with the hand roller until the roller takes only a thin, even film. The block must be carefully inked with the roller for each printing.

If the printing is done on a regular printing press, the block is locked up in a chase, and the inking rollers of the press will do the inking automatically. But, if the printing is to be done on a letter-press, the block must be inked by hand for each impression. When a letter-press is used a couple of smooth, folded news-

papers should be placed on the bed of the press to form a soft "packing." The inked block is then laid, face down, on a sheet of the stock to be printed, and strong pressure is applied by the platen of the press. It is necessary, of course, to lay the inked block in the desired position on the sheet of stock to be printed, and care must be taken to prevent smearing.

Pictures or designs, printed from linoleum blocks, can be hand-colored with a brush and water color paints. Or, two-color effects may be obtained by printing in one color on colored paper, such as black on yellow paper, dark-brown on buff paper, dark-green on primrose paper, etc.

BOOK ILLUSTRATION CUT FROM A LINOLEUM BLOCK BY F. W. SCHAEFER, NEW YORK CITY.
(Reduced One-Third.)

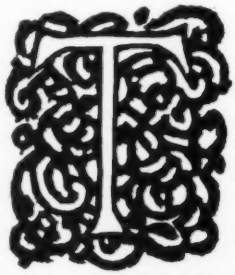
To print from a block of art gum no press is necessary. In fact, by using different colors of printers' ink, applied to the surface of the engraved block with brushes, a design may be printed in several colors at one operation. The inked block of art gum is simply held in the hand, and is pressed down firmly upon the object to be printed. Parchment paper for lamp shades, material for window curtains, leather or other material can be decorated in this way. Ordinary house paints may also be utilized in applying colors to a block of art gum.

The original drawing for a block of art gum is made the same as for a block of linoleum; a tracing is made of the drawing on a sheet of transparent paper; the piece of tracing paper is pasted (upside down) on one side of the block, and then the design is cut out as with the linoleum. When printing from a block of art gum, lay some smooth newspapers on a table, lay the material to be printed on top of the newspapers, and then print the material as you would apply a rubber stamp. For one-color printing an ink pad may be made of felt and linen, and the pad may be saturated with printers' ink or house paint. The pad will help you to do the stamping more rapidly than by the plan of painting the block with a brush.

Potato block printing is done in practically the same manner as with a block of art gum. It is a comparatively easy matter to cut a printing block of this type. First, a good-size, sound potato is cut in half, and then on the smooth surface of one piece the design is cut out after the manner of a linoleum block. A simple method is to paste a "cutout" of the drawing on the surface to be carved, and then to minutely cut away all sections which have not been covered by the cutout drawing. The cutting should be done about one-

eighth of an inch deep. The shape of the half of potato is comfortable to the hand, and the stamping can be done with no difficulty.

The potato blocks may be used for stamping colored designs on window curtains, paper for lamp shades and other materials. The printing surface of the block may be painted with printers' ink, house paint, artists' paints, water colors, or thick dye mixtures of any kind.



INITIAL LETTER CUT FROM A BLOCK BY STUDENTS IN PUBLIC SCHOOL No. 24, JERSEY CITY, N. J.

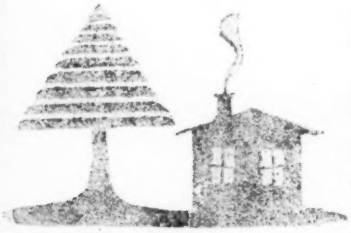


ILLUSTRATION ENGRAVED ON A BLOCK OF ART GUM.

INITIAL LETTERS CUT IN LINOLEUM AND USED IN A VOCATIONAL SCHOOL CATALOG.

As in the case of a block of art gum, the potato block may be painted to print several different colors at the same time.

Printing blocks, for small jobs, can also be made from apples, carrots or turnips. Unique designs, having "grained" effects, can be printed from blocks made from the stems of plants, an onion, a beet, and other vegetables.

Block printing will help in developing craftsmanship. It will enable you to express your own ideas of art. Experiment with the various processes described and you will achieve remarkable results.

Pewter and the Revival of Its Use

Prof. William H. Varnum, University of Wisconsin.

TO the teacher and student of the art crafts, ancient tools and materials supply a field rich in traditions and associations of infinite value; of processes readily to be assimilated with modern school activities. For some time the writer has been testing the possibilities of a material scarcely known to the average individual but of great importance to the craftsmen of the middle ages, a metal admirably adapted to the abilities of the high school pupil or to craftsmen of professional standing, an alloy which makes possible a large range of practical and attractive articles. I refer to Britannia metal, a moderate priced variation of pewter, with past traditions and practices of the best craftsmanship of the minor arts to its credit.

Before considering the technic of its uses and manufacture, a brief review of its past history throws light on many curious customs of interest. Britannia metal was similar to, and succeeded, pewter but it is around the manufacture of pewter utensils that we find associated the famous crafts guilds of the middle ages.

While Britannia metal is a comparatively recent development, the use of pewter goes back to the time of the Romans. Supplanting wooden ware, it was used extensively for such household utensils as spoons, plates, containers, salt cellars and trays, particularly in countries and epochs marked by scarcity of wood or pottery.

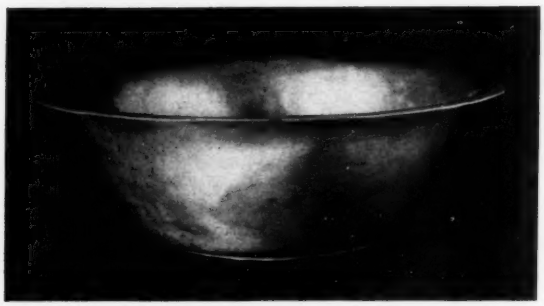
In the middle ages, itinerant pewterers were accustomed to go from town to town, repairing or recasting damaged wares. At this period common pewter was composed of an alloy of 80 parts tin to 20 of lead. These traveling workmen frequently adulterated pewter with a larger lead content, producing a miserable "Black Pewter" which, early in the fourteenth century, caused an English Parliament to brand them as "deceivable hawkers" which was undoubtedly true.

Rise of the Industry.

In England, during the reign of Edward III (A. D. 1348), the stationary or permanently located pewterers established a well-organized guild or association with the aim, partly to prohibit dishonest products and partly to protect the industry by eliminating those outside of the guild. At this time pewter was the material in universal use by the middle and upper classes for the table and sideboard; silver plate appeared only on the tables of the highest nobles or in the royal palaces.

It is easy to realize that with this lucrative field the Guild of the Pewterers would naturally increase in strength and power. With this growth of power we find the Pewterers' Company petitioning successfully for authority to supervise alloys, to destroy poor pewter or pewter products, for the right of search throughout England for inferior material; to limit the manufacture of pewter to skilled workmen or their apprentices. Let it be said, however, that any competent workman, regardless of whether he had served his apprenticeship, was admitted to the Company.

With the Pewterers' Guild in full and legal control of material and quality of product, the finest type of work was produced. Repeated offenses of bad craftsmanship or poor quality of the alloy on the part of a member of the Company were punished by forfeiture of the wares and the privilege of manufacture; and in addition to this, heavy fines were imposed. This meant the loss of membership in the Company which deprived the workman of his livelihood, since he could neither sell nor be employed.



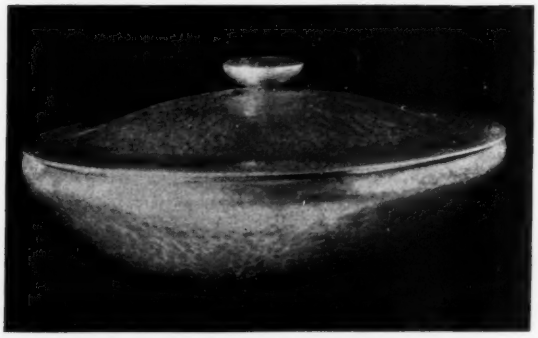
BERRY BOWL MADE OF BRITANNIA METAL.

Another regulation of the Pewterers' Company forbade a master to employ a workman without a statement as to his character from his previous master, and (an interesting commentary on modern practice) under no circumstances could an employer coax a workman away from another master. To carry out the idea of brotherhood in the society, all disputes were to be settled within the guild, hence law-suits were unknown. Upon settling these disputes, the losing litigant was required to invite the winner and his wife to supper, and there to be merry together and so be friends henceforth. The Pewterers' Company Court held in London in 1559 decreed, "that Robert West should bring his wife upon Tuesday next to reconcile herself to Mr. Cacher and others of the Company for her naughty misdemeanor of the tongue towards them." We have no record of whether or not this decree was fulfilled or as to the particular grievance of Mr. Cacher.

Decline of the Industry.

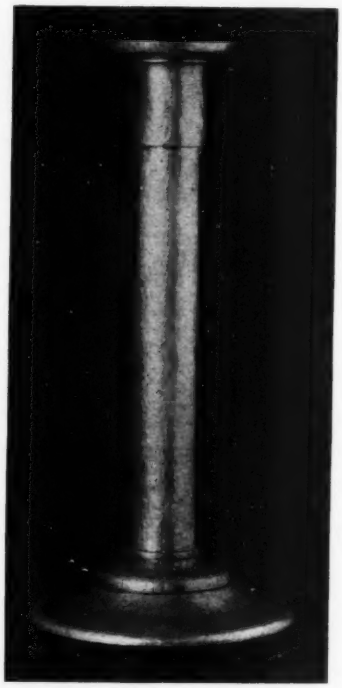
With power comes the desire for more. So it was with the guild and regulations were passed tightening the monopoly. Trade secrets were guarded so closely that no English pewterer could leave his country, no work was conducted in public, exportation of pewter was stopped, a monopoly of the tin mining trade attempted, all spinning of metal prohibited as a mechanical product, and the right of search pushed with vigor. Many violations of trade standards were met by confiscation of the wares and heavy fines imposed upon the workers.

But inventions and human discord checked this tight monopoly, which was, in a way unfortunate, in that the monopoly stood for the best ideals in workmanship and materials. With the introduction of cheap earthenware and china for table and domestic uses, the products of the pewterer were ousted. With civil wars sweeping the country, the quality of the material experienced a decadence and the valuable right of search was necessarily abandoned. And lastly, with the discovery in the middle of the eighteenth century that an alloy resembling pewter, Britannia metal, could be plated with silver (the forerunner of our modern plated ware), the remaining uses of pewter lapsed.



BOWL WITH LID MADE OF BRITANNIA METAL.

I have entered into the ideals of the Pewterers' Company with the intention of illustrating how the workmen themselves, insisted upon the maintenance of the best standards of design, high standards of workmanship and high standards of the quality of metal. These ideals should control any attempt to revive successfully the original spirit in which the wares were produced.



EIGHT PIECE CANDLE STICK MADE OF BRITANNIA METAL.

Britannia Metal.

While it is true that Britannia metal was a factor in the decline of the use of pewter, it is, I believe, a metal superior to pewter for modern school uses. Pewter making is practically a lost art, while Britannia metal, its successor, falling under the white metal group of modern industrial practice, occupies a prominent place as a base in the manufacture of plated ware. Of the two qualities which led to its replacement of pewter—the ease with which it could be electroplated and its adaptability to lathe spinning—the former may be disregarded for school use. The readiness with which it may be spun on the lathe means that it is both ductile and malleable to a high degree.

In school crafts courses we now have copper, brass and silver. Many students are unable to carry these materials past the more elementary flat and shallow forms of construction, inasmuch as the boys and girls are unable to give sufficient power to the hammer strokes necessary to develop the more complex and interesting problems indicated by the illustrations accompanying this article. This purely physical condition causes a struggle between the student and the material in which the metal fails to be sufficiently responsive to his demands. Under these conditions, enthusiasm wanes and the proper reaction to an art metal course is lost. It is true that we have jewelry as an important outlet, but I have in mind larger problems similar to house furnishings; electric fixtures, lamps, candlesticks, and challenge cups, trophies, trays, flower vases and table ware.

For these and similar projects, Britannia ware is completely responsive. While spinning is the process followed in the industries of today, it was outlawed by the old pewterers. As I am advocating following the old time methods, lathe work should be subordinated to the medieval processes of beating down, raising and casting, although a certain amount of spinning has its industrial significance.

Old formulae state the alloy of Britannia metal to be 150 parts of tin, 10 of antimony and 3 of copper. Modern alloys show 91 parts of tin, 7.5 antimony and 1.5 of copper. The color of the metal resembles silver. The slight patina which forms on its surface after five or six months may be removed readily, although in old pewter, it is regarded as a distinct attribute of value. The cost is about double that of copper and the material may be secured in sheets of practically any size and gauge. The articles illustrated were made by the raising process from the sheet by my students in the University of Wisconsin. Methods of construction, solders, fluxes and exact cost of materials will be considered in a later article.

CREAM AND SUGAR SET WITH CAST HANDLES MADE OF BRITANNIA METAL.

In closing my brief for the use of Britannia metal let me repeat that its malleability without annealing, beauty of texture, and color, comparative freedom from oxidation, ease of soldering, and utilitarian value, not to overlook the excellent ideals which have governed its past production, make the metal a welcome addition to an art metal course.

Sheraton Furniture

Leslie G. Martin, West Henrietta, N. Y.

THOMAS SHERATON was one of the greatest designers of the eighteenth century, born in 1750 and died in 1806 A. D. He was also a drawing teacher, bookseller, preacher, and cabinet maker.

He published the "Cabinet-makers and Upholsterers' Drawing Book," in three editions. This book was divided into three divisions, giving a treatise on perspective, the orders of architecture, geometry and furniture designs. He inaugurated a style of his own which had considerable effect on the cabinet makers of that time, although his work sometimes shows the influence of Robert Adam and Heppelwhite. This book was not published as an advertisement for his business, as he was not a furniture manufacturer, but it was to supply the demand for new designs that would bring business and new friends to furniture houses in business at that time.

He also started an encyclopedia for artists and cabinet-makers, but this was never completed. In spite of Sheraton's great ability as a designer, he died in poverty in London.

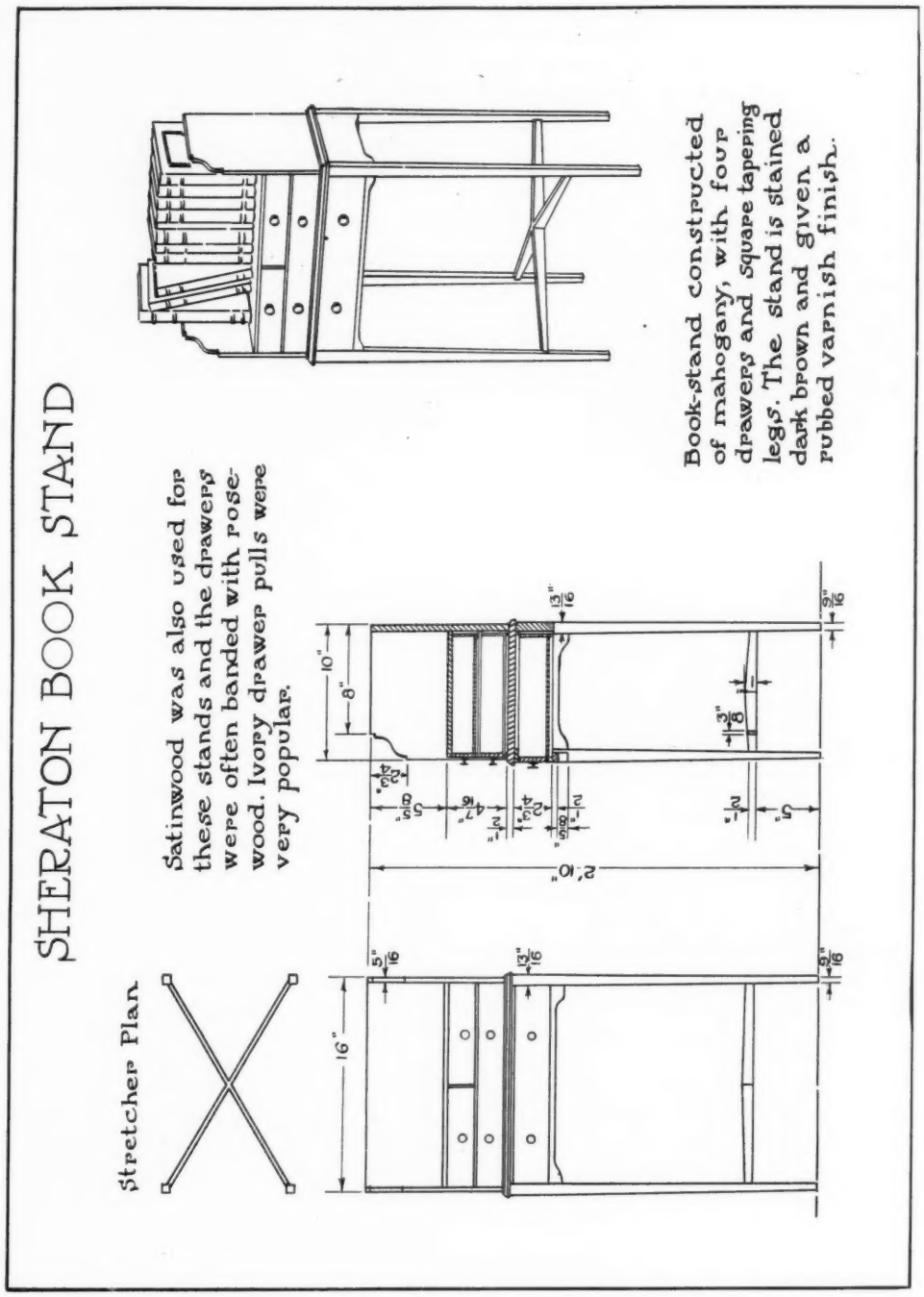
Sheraton designed beautiful sideboards in mahogany which were inlaid with colored marquetry and lines of holly wood. They usually had a pedestal form of drawers or cupboards at each end, with a center drawer between. Occasionally there was a center cupboard with tambour slide doors. Others were nearly semi-circular in plan. They were a sort of combination of Adam and Heppelwhite designs. The fronts were often shaped and the legs tapered with pointed toes. Some had a fine brass railing at the top of the back. Fine veneer and satinwood cross-banding were used, and ebony, rosewood and tulip-wood were often employed in the decorations. The handles were of an oval patera pattern. Lion-headed ring handles came into use at the close of the eighteenth century.

The sideboards were usually accompanied by a pair of knife boxes with sloping fronts. The inside was generally inlaid, sometimes silver mounted and arranged with holes for holding silver.

The vase-shaped or urn knife-boxes came later. They were of beautiful proportions and examples of fine cabinet work. Sometimes satinwood veneer was used and inlaid with checkered lines. Some of the urn cases were decagonal in cross-section, and the urn had a base with small bracket feet. They were quite expensive articles of furniture.

Some of the bookcases of this time were very remarkable examples of high class workmanship. Mahogany was generally used while some of the finer woods like satinwood, rosewood, marquetry and holly were used for the finer details. Some cases had a cupboard in the lower section with glass doors above with an ornate pediment and cornice. Others were of the bureau bookcase type and had drawers in the lower carcase and a desk equipment in the top drawer which pulled out, allowing the front to drop down as a writing bed. The handles were often silvered and engraved. Another type had a cylindrical-front similar to the modern roll-top desk. The satinwood bureau cabinets were often painted with flower decorations. Still another type, which had open shelving at the top with a cupboard below, was used as a china cabinet.

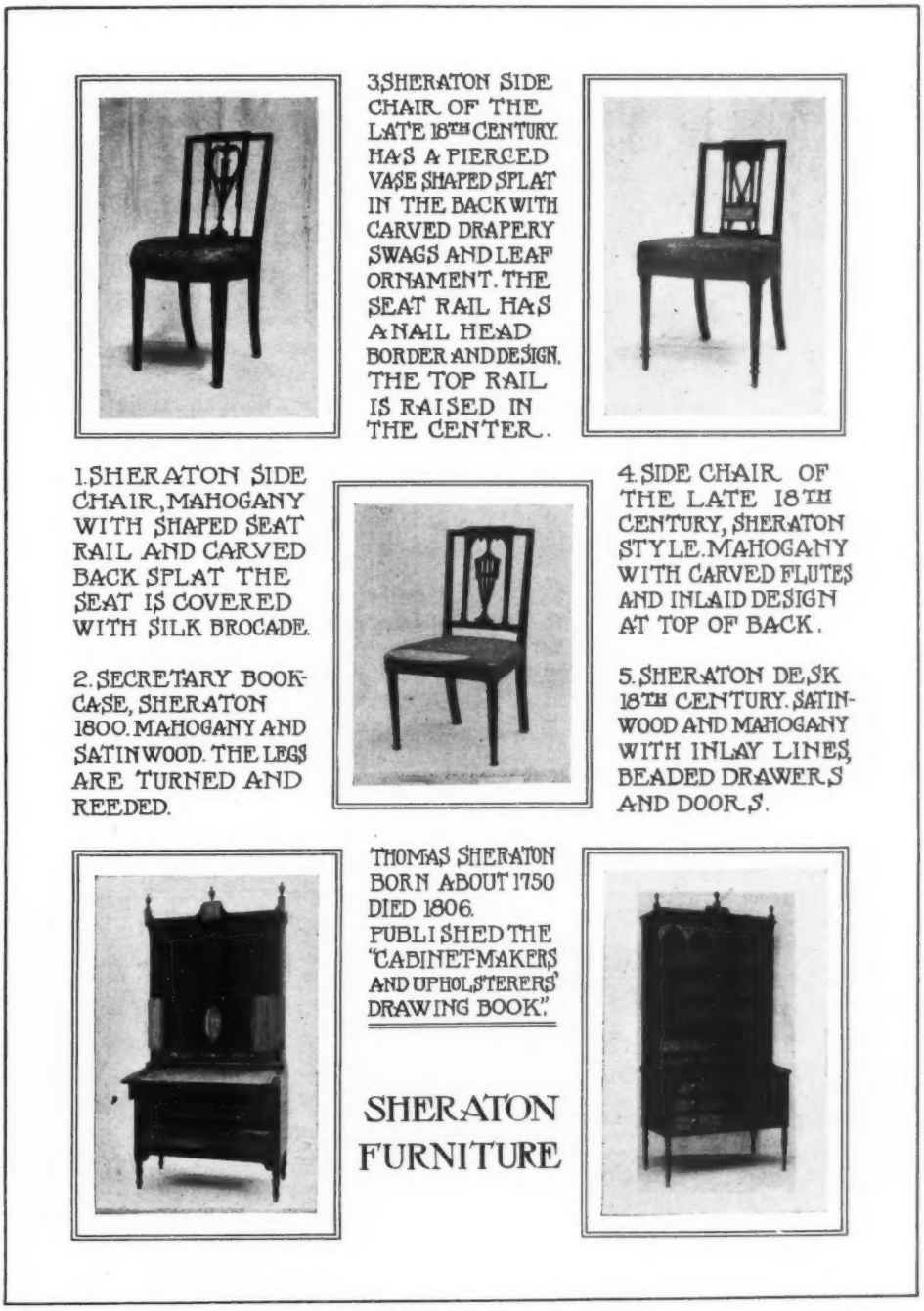
Sheraton designed furniture mostly for the middle classes, having but few patrons among the nobility.


SHERATON BOOK STAND
Book-stand constructed of mahogany, with four drawers and square tapering legs. The stand is stained dark brown and given a rubbed varnish finish.
Satinwood was also used for these stands and the drawers were often banded with rosewood. Ivory drawer pulls were very popular.
Stretcher Plan.
2'-10"
10"
8"
16"

From 1795 to 1800 the furniture was very expensive, due to poor business conditions and the high cost of production.

Wardrobes were generally made with two doors with trays back of them and drawers below in the lower part. Another type was made in which could be hung the flowing dresses of the ladies of that period. The doors were often crossbanded with rosewood and inlaid with holly lines in an oval shape. Veneering and large marquetry designs were employed as well as beading on the drawer fronts. Flush escutcheons of ivory and ring handles were generally used. These wardrobes often had a graceful "swan-necked" pediment.

Dressing tables and writing tables were made in large numbers. They were sometimes combined in one piece of furniture, the top having two leaves which folded outward and a pigeon-hole arrangement at the back which raised and lowered. The legs were tapered

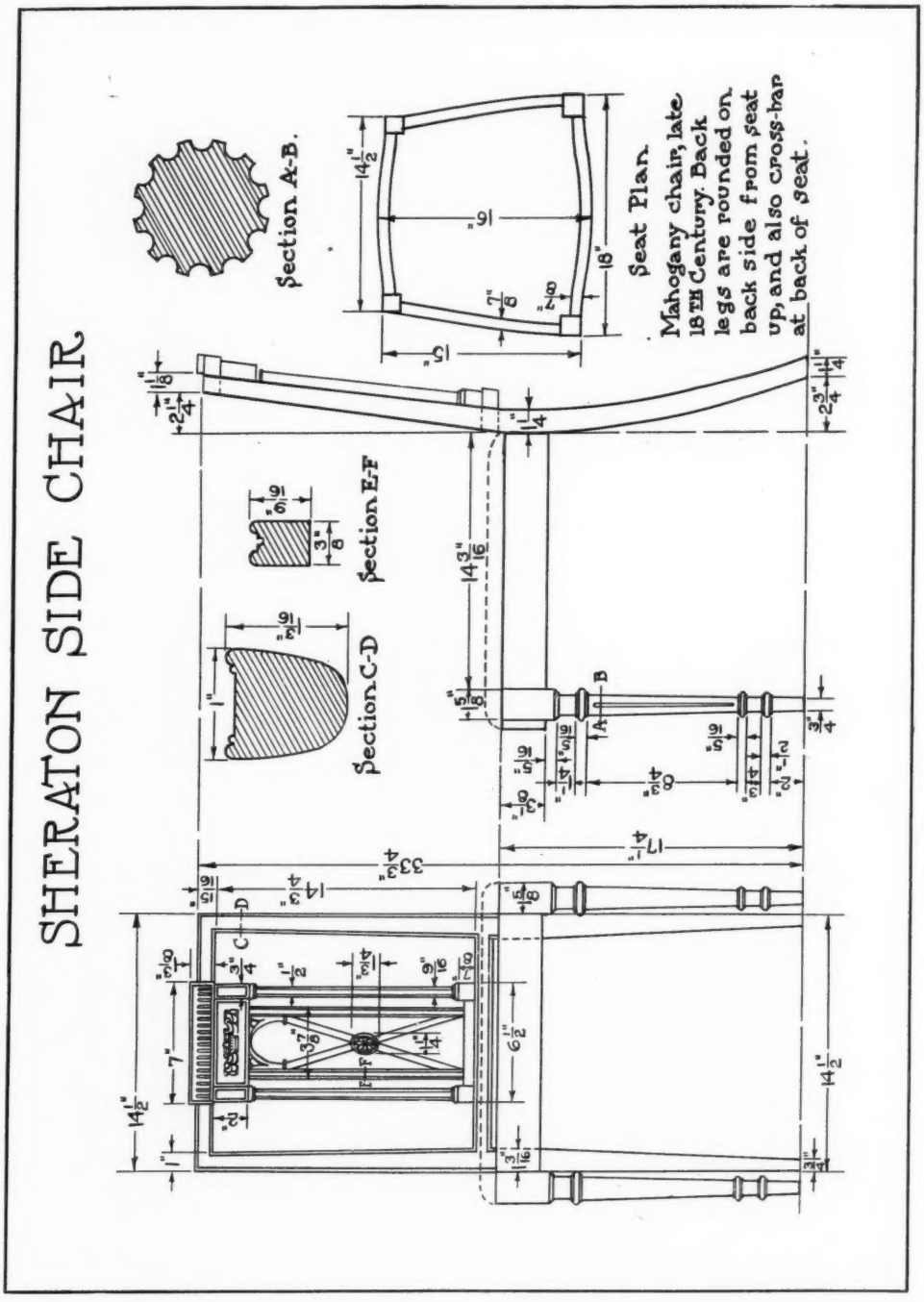

3. SHERATON SIDE CHAIR OF THE LATE 18TH CENTURY. HAS A PIERCED VASE SHAPED SPLAT IN THE BACK WITH CARVED DRAPERY SWAGS AND LEAF ORNAMENT. THE SEAT RAIL HAS A NAIL HEAD BORDER AND DESIGN. THE TOP RAIL IS RAISED IN THE CENTER.
1. SHERATON SIDE CHAIR, MAHOGANY WITH SHAPED SEAT RAIL AND CARVED BACK SPLAT THE SEAT IS COVERED WITH SILK BROCADE.
2. SECRETARY BOOK-CASE, SHERATON 1800. MAHOGANY AND SATINWOOD. THE LEGS ARE TURNED AND REEDED.
4. SIDE CHAIR OF THE LATE 18TH CENTURY, SHERATON STYLE. MAHOGANY WITH CARVED FLUTES AND INLAID DESIGN AT TOP OF BACK.
5. SHERATON DESK 18TH CENTURY. SATIN-WOOD AND MAHOGANY WITH INLAY LINES, BEADED DRAWERS AND DOORS.
THOMAS SHERATON BORN ABOUT 1750 DIED 1806. PUBLISHED THE "CABINET-MAKERS AND UPHOLSTERERS' DRAWING BOOK."
SHERATON FURNITURE

EXAMPLES OF SHERATON FURNITURE.

and fitted with small castors. Tambour fronts were often used.

Wash-stands were quite small. They had a compartment at the top large enough to accommodate a wash basin and usually a cupboard or drawer below. Mirrors were sometimes added. Mahogany and satinwood were used for their construction.

Small tripod stands and work-tables were quite numerous and were usually inlaid and constructed to match the dressing tables. These small tables sometimes had a bookrack at the top and were called shevers. The legs were often made to curve out at the bottom.


SHERATON SIDE CHAIR
Section A-B.
Seat Plan.
Mahogany chair, late 18TH Century. Back legs are rounded on back side from seat up, and also cross-bar at back of seat.
Section E-F
Section C-D

The hinged flap-table or "Pembroke" table was made with hinged brackets supporting the top. Some were fitted as game tables with reversible tops which slid in grooves. Many of the small parlor tables and commodes were elaborately painted and decorated, or inlaid with engraved marquetry.

The four-post bedsteads were still in use. They were usually painted in light colors and decorated and covered with flowered chintz hangings.

The pole-screen was very popular during this time. Needlework panels or painted silks were displayed on these, and the stands were well designed.

Sheraton used the square-back form of chair more than any other type. He occasionally used the shield back. Some chairs had a raised panel at the top of the square back. Lattice work, pierced or carved in the back splat, was also a feature. The front and sides of the seat were often curved. Both cane and upholstered seats were used. The legs and back rails were usually turned, fluted or reeded.

Carved pendant drapery was also used in connection with pierced splats and lattice work. Certain types used square tapering legs which finished in a moulded foot. It was very seldom that a stretcher was used to unite the legs. Some of his best designs showed the balusters connecting the top rail of the back with a lower rail, instead of extending way to the seat frame. This type always had turned legs with small beads or collars at intervals. The foot sometimes pointed out. They were usually painted black, with beads in gold.

The outer uprights of some chair backs, as well as the balusters in the backs, were often decorated with a water-leaf capital or decoration. Beechwood was often used for chair construction and was painted and gilded. Some chairs showed a French influence, with a broad moulded top rail on the back, with a panel decorated in the manner of Pergolesi. The "Lyre-splats" were also fashionable. Chairs were made wider at the end of the eighteenth century.

Square-back settees were made similar to the chairs, with a loose cushion and backs of upholstery, cane or lattice work. Both closed and open arms were used with the arm curving into a vase-shaped baluster which joined on the turned front legs. The frame was sometimes inlaid and on others was painted and gilded, or decorated with garlands of flowers.

The photographs accompanying this article are shown by courtesy of the Metropolitan Museum of Art, N. Y., and the Museum of Art, Philadelphia, Penn.

Printing in the School

John F. Locke, Department of Vocational Education, Cincinnati. Ohio.

ONE of the greatest and latest tendencies in modern education is the introduction of trade subjects into the industrial-arts departments of high schools. The placing of these courses in the curriculum cannot help but become a big factor in the continuance of the education of a large number of boys and girls. These courses give the pupil a certain practical insight into the elements of the different trades. They also tend to prepare the pupil for wage-earning during vacations. This last factor alone justifies their maintenance, for it oftentimes allows the pupil to stay in school longer than he otherwise could. But aside from this feature, all of these courses have their educational values or they would not have been introduced into the curriculum. Any change in policy, in education, as in business, must be justified before it is made.

Speech probably came as natural to man as did the expression of feelings and desires, but writing and later printing were born of necessity. The history of the advance of civilization has been recorded with the mallet and flint, brush and quill, then the pen and finally "printers' ink."

Is it any wonder that the study of printing is growing by leaps and bounds in all of the high schools, trade and technical schools? Take the study of English, our own language. The raw material of printing is language—any language. Horace Greeley once said: "A printer's case is a better educator than high school or college." Not many educators will agree with this. It is too radical a view, but there is no disputing the fact that printing has a very pronounced educational value.

Not until recent years has the idea developed that a laboratory is needed in conjunction with any course of study, except chemistry and physics. But today the school print shop has developed into the English laboratory. The growth of the study of printing has been phenomenal, simply because it is absolutely sound from an educational viewpoint as well as effective for prolonging school attendance.

The foremost feature of printing is its relation to textbook instruction. The constant formation of words and sentences with type is one of the best ways to teach a boy spelling, punctuation, paragraphing, hyphenation, and capitalization. It affords an opportunity for the practical application of classroom information gained of these things in other classrooms. It develops a sense and appreciation for form and arrangement, it brings out whatever artistic ability a boy may possess. It coordinates and trains both the mind and the hand. But above all it compels accuracy, offers a field for individuality, encourages skill and opens a new door for the development of ability.

All of the principles of art and design, taught in the drawing room are exemplified and applied in the printshop. Into the printed page, and other work done in the shop go the practical application of the principles of balance and harmony. The elements of arithmetic are taxed heavily in the calculations required for the amounts of paper required on different jobs. The division of space and matter into pages also provides ample opportunity for the application of arithmetic.

The real educational value of this course lies in the correct application of all these elements. There are only two factors that detract from the value of this course. One is the attempt on the part of some teachers to turn it out of the fields of education into the pastures of production. When this is done it yields only one return, a financial one instead of one of strict educational value. The second detracting factor of this course is due to its not being made practical to the industry of which it is the child. The value obtained from any vocational subject is in strict proportion to the degree in which it is made practical.

Printing is the medium of knowledge, just as money is the medium of exchange, and in this fact also lies the secret of the value of this course. The boy soon learns this and realizes that in order to continue in this interesting and fascinating work he must apply himself diligently to many of his other courses. It is often the case that a boy who dislikes books and finds his studies tedious, is forced to change his ideas on account of his desire to excel in this subject. When this happens, as I have seen it happen, printing has simply aided one more to find his niche.

There is no school problem of today that combines more of the entire facilities of a school than the publication of a school paper. If, as it should be, the production of the students, each department of the school has some part assigned in its publication. The English class should be responsible for the English, spelling and grammar. The compositors should be responsible for the typesetting and make-up. The pressroom boys should be responsible for the cutting of the stock, the make-ready, the presswork, the folding, and the stitching. Consequently a practical knowledge of all of the work taught is brought into use. Printing embodies all of the advantages of manual training and at the same time correlates with it a practical application of design, and a thorough knowledge of English and all of the other related academic subjects.

A school paper is to the school what a newspaper is to the community. The newspaper is a moulder of public opinion while the school paper is a stimulant for younger minds. It is also a source of pride and interest to the students, especially to those who have a part in its making. Both the newspaper and the school paper are highly educational and aid materially in the good influence brought about by a production of good reading matter. The only real difference between the two is that the newspaper influences mature minds, while the school paper influences immature minds.

A great number of the students who will never enter the printing industry will later in life enter occupations that use pamphlets, catalogs and other advertising matter, and the things learned in school will stand them in good stead here. As a result of the immense amount of advertising being done, training gained in this study will be of benefit in almost every walk of life.

Suggestions for Manual Training Teachers[1]

William B. Courtenay, Director of Industrial Arts, Hackensack, N. J.

THE following suggestions and criticisms are submitted in the spirit of cooperation rather than the spirit of fault finding. All are based on sound psychology and good educational practice. Most all of us make some of the mistakes listed herein, and this list is submitted in order that we may check up our methods of teaching along approved lines.

I. Organization.

1. There are numerous ways of wasting the pupils' time, i. e., by not being prepared, slow distribution or collection of materials or equipment, not beginning on time, poor dismissal, lack of supplies, no organization, over organization, haphazard methods of teaching, etc. Are we wasting the pupils' time?

2. The roll book should be checked every day for every class and all absentees and tardiness reported.

3. The condition of the tool room, stain table, lumber rack, lockers, supplies and hardware at the close of every class should be inspected.

4. It is as important that the instructor keep his desk in tiptop shape as it is to insist that the boys clean their benches.

5. The shop library (and every shop should have one) should be accessible to all the pupils and should function as part of the equipment.

6. Reference materials and shop drawings should be classified and filed frequently and not allowed to accumulate until it is almost impossible to find the material needed.

7. Some taxpayers when visiting the shops, look for tools, hardware and expensive supplies on the floor. Do they find any in your shop?

8. The wise teacher will not permit the class to dismiss themselves, but will have some definite routine for dismissal.

II. Methods.

9. Plan your lesson for every class every day.

10. Very often we expect too much from the pupils, or take too much for granted, and in some cases blame some other teachers for not having taught the thing properly. Do you?

11. Do not be familiar with pupils nor permit them to be familiar with you. Above all, do not permit yourself to become sarcastic or insinuating.

12. The use of slang, nicknames, and poor English is inexcusable.

13. The most effective teaching can be done when the class is working, by the instructor moving about among the pupils, offering advice, and making suggestions, and not from a desk or chair to which a pupil must bring his work for inspection. This is particularly true of mechanical drawing.

14. Illustrative materials and charts made by the pupils, frequent use of the blackboard and bulletin boards are splendid aids to teaching.

[1]Submitted at a Conference of Shop Teachers, January, 1923.

15. Demonstrations should be actually performed by the instructor, not talked about. A demonstration is doing, not talking.

16. Directions should be clear, concise and fully illustrated. Do not expect all boys to get them the first time. It will be necessary to repeat.

17. We cannot teach effectively if part of the class is inattentive. *Insist* on good attention during a demonstration or when a direction is given.

18. If you have no enthusiasm or interest in the class or work they are doing, is it fair to expect them to have what you lack?

19. An untidy shop, dull tools and a tool room "down at the heel" are not conducive to good work. Keep your shop neat and businesslike, the tools sharp, and make the tool room worth while.

20. Give one direction at a time, explain one thing at a time, demonstrate or illustrate one thing at a time, teach one thing at a time, and check up your teaching by frequent drills.

21. Distribute your questions among the class, ask more indirect questions than direct questions, do not answer your own questions nor ask thoughtless questions.

22. All of us have had varied experiences and lots of troubles. Do not harp on them to such an extent that it will become boresome to the class.

23. We are dealing with children, not adults; with humans, not machines. They will make mistakes and we should try to have them profit by the mistakes rather than shouting, "Didn't I tell you to do thus and so?"

24. Avoid teaching in a negative way, and by all means do not describe or demonstrate the wrong way of doing a thing, unless there is some good reason for doing so.

25. We are in charge of a group of children. Our voice will play a very important part in giving directions effectively. If it is dead and monotonous, naturally the class will react in the same manner.

26. We are rated a success or a failure very often by the reports carried home by the pupils. This does not mean grades or written reports, but what a pupil tells his parents we said or did in the classroom. This is very important as very often what we say is misconstrued or interpreted in the wrong way. Be careful what you say to your classes.

27. Our answer to a suggestion or criticism that we were just going to do thus and so, or I told the class not to do it that way, is one evidence of poor teaching. The "alibi" will get us by sometimes, but not always.

28. There is no excuse with our present theory of manual training, in assigning a purely exercise project, even if it is simply drawing a light line, setting a line of type, squaring a block, making sample joint, etc. The instructor needs to change his mental attitude, or he will become lost in the shuffle.

29. Generally it is not necessary that certain trade knowledge or tool manipulation be taught before a project can be undertaken.

30. Avoid introducing extraneous material into the discussion, mix the lecture method of presentation with the inductive method.

31. If necessary create a situation in order to "put over" some point in your lesson.

32. Let us do a little more experimentation with our projects, methods, pupils and organization.

33. Are we *teaching* school or are we simply *keeping* school?

III. Discipline.

34. We often feel like "wiping up the place" with some impudent or disorderly pupil. Don't do it. It is against the law. If you do, be prepared to take your medicine.

35. Too often we use the same punishment for every offense. The punishment should suit the offense and never at any time should the instructor forget that he is dealing with children.

36. Do not make a practice of detaining pupils after school, particularly for minor offenses. The practice, if continued is usually ar evidence of weak discipline.

37. Do not argue or engage in debates with individual pupils, particularly in front of the whole class.

38. Rules and regulations are all right for certain purposes, but they will not fit all occasions and all situations. Good judgment must be used by the instructor in formulating rules, and a great deal of discretion must be used when dealing with pupils who have broken some regulation.

39. Don't expect *all* boys to behave when your back is turned, particularly if you have threatened them with certain punishment if they don't. Some are naturally curious to see what you will do.

40. If you are not "up to the minute" physically or mentally, do not take it out on the class, nor tell them they are the worst class you ever had. Naturally, they will live up to their reputation.

41. Above all, be fair and square to all your pupils. Apply the "Golden Rule."

42. Very often it does not pay to *see too much*. Usually there is a motive for misconduct, and some can be overlooked.

43. You are teaching a class of several pupils, not one. Be *aware* of *all* of them. Develop that *sixth sense* so important to successful teachers.

IV. General.

44. An instructor all dressed up in his "best" cannot expect his boys to take off their coats and get down to work. *All* shop and printing teachers should provide themselves with some sort of jacket, coat, or overalls.

45. We must have and maintain a professional feeling and spirit toward each other, and although we may not respect each other personally, we must respect motives, and regardless of feeling be loyal to each other.

46. We are engaged in a common undertaking, and as such our business is teaching, which would include all phases of teaching and not simply shop, printing or drawing.

47. Every one of us can get something from the other if we will take the trouble to look for it.

48. Where two or more instructors use or work in the same shop, each should cooperate and help the other to the fullest extent.

49. We should be interested in anything that concerns our business, which is teaching. Too often we are inclined to say, "Well, that does not concern my work, or that lecture or class will not do me any good."

50. Too often we isolate ourselves from the rest of the school system. Would it not be of advantage to all of us to know what the other fellow is doing by frequent visitation? How many of us make it a business to visit an academic classroom to meet the teacher, see the class at work, or discuss some problems with the teacher?

51. All of us can find some good reading along educational lines if we look for it, and along our own particular lines, by reading the following magazines: "Industrial Arts," "Industrial Education," "Vocational Education," or "School Arts."

52. Let us cooperate to a common purpose; boost our work in every way by always placing our "best foot" first, to the end that the department will function as it should and be an honest part of the school system.

INDUSTRIAL-ARTS MAGAZINE

E. J. LAKE S. J. VAUGHN

Editors

EDITORIAL

WANTED: AN ANSWER TO A TEACHER'S QUESTION.

A teacher from Kansas City sends in an order which we haven't been able to fill at the present writing. He wants to know what city of 80,000 population has the best system of manual and industrial arts work in this country.

We are, therefore, asking our readers to nominate cities for this honor and to back up their nominations with brief, illustrated articles in behalf of the cities of their selection.

The fun will start with the earliest possible issue after the articles begin to arrive.

WASTEFUL AND UNSIGHTLY NEGLIGENCE.

Here's a chance to get rich. Convince people that they should paint all the houses that need painting and then go into the paint business. On an extended trip recently, we were struck by the amazing and costly negligence which leaves residences, farm buildings and business buildings to fall into unsightliness and decay for want of a coat of paint.

In such a condition two considerations are ignored —one economic and the other esthetic. Surely the economic aspect of paint needs no argument. The value of paint as a preservative for building materials is one of earliest recognition and greatest importance. It would seem, therefore, that from mere economy's sake, people would take the precaution at least to the extent of an occasional coat of paint for their residences.

But there is another phase of the matter that is vastly important which cannot be wholly separated from the economic question. That is the value, from an esthetic standpoint, which a fresh coat of paint adds to a piece of property. We are wondering whether a topic like this may not deserve a greater place in the consideration of art and industrial-art classes than it now occupies. We can conceive that the public schools of an ordinary town might materially modify the appearance of its homes and thus add greatly to its property value and its desirability for residence purposes by a persistent emphasis on the question of house painting.

THE CHILDREN'S WELFARE AND THE COST.

Enlightened public opinion in America has shown very little disposition to quibble or hesitate over the *cost* of some privilege or advantage which the people consider vital to the welfare and happiness of their children.

It certainly is not a voice from the common people that cries out against the "burdensome costs of the enriched curriculum" which undertakes to give children of varied talents absolutely equal opportunities.

Exactly the same arguments were made at the outset against the whole public school idea. It "was a terrific expense." The same arguments could be made, and are being made, against good roads and similar improvements.

The cry of costs and financial bankruptcy on account of public education is not very impressive in a country that spends more in *one year for useless and hurtful luxuries than it has spent in almost its entire history for education!*

ART AND HISTORY.

It is interesting to compare art with history. The historian is busy securing evidence of events that have passed and interpreting the lives and impressions of the people who took part in them. So the art of a period becomes part of the history of that period. The artist is engaged in expressing the impressions of his own time and his work becomes part of the history of his period.

If the artist reverts to history he becomes historian.

If the historian uses his imagination and indulges in the impressionism of the artist he fails of historical judgment.

History is proven to be constant repetition. Art that is repeated is transformed from art to history by the process of repetition. The dominant and subtle distinction of art is originality. How little of that distinguishing quality we find in our own expressions!

TEACHERS AS STUDENTS IN SUMMER CLASSES.

Now is the time when great multitudes of teachers rush to the educational institutions to refresh their educational lore, to gain helpful items of information, to get new points of view, and to check up on themselves generally in their work.

The development of the summer school has been one of the most powerful agencies in this country for the advancement of education and the standard of teaching.

For a teacher to get any particular advantage from summer courses, it is absolutely necessary for that teacher to assume at once the *student attitude.* The teaching habit and attitude have become so firmly fixed with some that they find it almost impossible to take the student place and hand over to others the prerogative of teacher. Many a summer student has found his summer's work useless and even hurtful by assuming the wrong attitude in class. Such student-teachers are sometimes garrulous, sometimes peevish, and sometimes show the "know-it-all" or "teach-me-if-you-dare" attitude. In any case, such attitudes are perfectly fatal to any satisfactory work.

The student-teachers are not always the only ones to show the wrong attitude. Many a teacher of a summer class has spoiled his chances of being helpful by assuming an air of superiority, or by ignoring the value of his student-teachers' experiences and opinions. A summer class teacher above all others, perhaps, should be a leader rather than dictator—a counsellor rather

than an oracle or prophet—a guider of thought rather than the promulgator of some "doctrine" or fixed opinion.

A spirit of tolerant cooperation will achieve in a summer course what no other force can possibly accomplish. There has been so much dogmatism in the field of education that we scarcely dare to hope for free, open conference and discussion in a class of matured people. Nevertheless this is what it should be, under the guidance of a master of the subject as a kind of referee. More of the seminar idea and less of dogmatic pronouncements would improve very materially many a summer course.

COMMENCEMENT AND AFTER.

The best graduation address we have heard this year was on the significant subject, "Going to Market." Of course, emphasis was placed on the need of self-development for service, but in this unique address it was also made emphatic that each individual carried a different commodity to market and was not only responsible for the goods but for the market as well.

The proverbial graduate puts a high estimate on his ability and knows nor thinks little of the market. That he should be held to account for the market of his abilities is beyond the comprehension of the American school graduate.

He presents his goods with assurance. He discounts their value under necessity. Then, all too young, he fills a conventional situation in a conventional manner and his horizon is fixed.

That which the schools have failed to inspire is his obligation of creating a demand for increasing abilities and the ambition to unlimited increase of ability.

CONSTRUCTIVE ADVERTISING.

There is coming to the keen business sense of our tradesmen the fundamental need of developing a demand for the best by education. While most of us are obliged to limit our desires and hope for a bargain in securing them, we resent the attempt to sell us something we are not certain we need just because it is cheap.

We pride ourselves on knowing what we want and in being able to pay a fair price for it. Advertising which is directed to make us conscious of our needs is more acceptable and convincing than advertising that appeals to a greedy advantage in trade.

The recent propaganda of The American Crayon Company is a worthy and constructive venture in advertising. A page on "Good Taste" directed to interest the parents in Art Education and to disparage the conception of Art as mere picture making is very much worth while.

As teachers we may well take up the challenge of Arthur Dean and "Dare to be civil to a pencil man without expecting a pencil."

Education to high standards of living and helpfulness is the best possible advertising for both teacher and tradesman. It is constructive advertising for it develops a market for the best and most needed commodities.

GOODS THAT SELL THEMSELVES.

The American mind is set on selling rather than on producing. Economic gain is made by production. Young Americans need education in the arts of fine production rather than training in the methods of selling. Salesmanship has been added to our school courses and the methods of salesmanship have become an obsession with our young people. The remark of a school-board President on the subject of school finances is, "We must sell the schools to the people." The remark was well intended but unfortunate in expression. The American people have been comparatively generous in their school expenditures. They have had abiding faith in education without adequate interest in the conduct of the schools. That interest is increasing and will probably continue to increase as the schools grow in size and increase in expense. It is estimated that at the present rate of increase our schools will be bankrupt in spite of the selling ability of those who would "sell the schools to the people."

There seems to be but one recourse. The faith of the people in the schools must be maintained and can only be maintained by making them most effective; so effective in fact that they will sell themselves at any price.

THE ART NEED OF THE CHILD, THE COMMUNITY, THE STATE.

C. Valentine Kirby, Pittsburgh.

First—All need sense training and a fine discrimination in the selection, purchase, and the use of manufactured articles for the person and the home. These may be described as 100 per cent needs.

Second—The community needs citizens who desire attractive homes, beautiful yards, parks, playgrounds, school buildings, museums, monuments, and all that contributes to civic beauty and civic pride.

Third—The merchant needs salespeople with fine taste and sound aesthetic judgments, beautiful show windows, and attractive advertising, for these will "sell the goods."

Fourth—The manufacturer of textiles, wall paper, carpets, rugs, furniture, pottery, glass, silverware, jewelry, lighting fixtures, and art metal products require designers and artistic craftsmen who will make these products ever more beautiful and attractive.

Fifth—The printing industry requires illustrators, designers of book and magazine covers, artistic magazine and poster advertising, and attractive labels for toilet preparations, food containers, etc.

Sixth—The State requires painters, sculptors, architects, and museum directors. It requires teachers and supervisors of art for its elementary and secondary schools, for its colleges and universities.

Part-Time School for Building Trades. A total of 175 apprentices have enrolled in the part-time brick mason class conducted by the Cleveland (Ohio) board of education in conjunction with the State Board of Education. Apprentices attend class four hours, or one-half day each week, on the employer's time. The instruction embraces, brick-laying, blue print reading and plant drawing as related to the trade.

The Weaving of Scarfs on Hand Looms

Mrs. Helen T. McGuinnis, Instructor, Central Junior High School, Springfield, Mass.

THE accompanying pictures show groups of boys and girls of the general auxiliary class at Central Street junior high school in Springfield, Mass.

All children are proud to exhibit articles made by themselves and so are these youngsters very proud and happy to make and then wear these beautiful scarfs woven on looms which are also made in the shop under my supervision.

In the special classes for deficient children, handwork is the greatest factor, for such children must be taught largely through their hands. I have found the weaving of these scarfs most valuable as there is a goal to reach, namely, to wear a scarf. As the cost of making one of these is only $1.20, the real value running as high as $15, most of the youngsters can have one for the cold winter months.

It is a great problem, not only for auxiliary classes but also for all classes. The project involves art for the study of color, the combination and use of more than one color, the blending of colors, and also for design, whether the scarf is to be made in squares, stripes, or border fashion. This leads on to correlating with geography—the study of wool, how raised, and how treated to make these woolen yarns; thus, affording a great opportunity to compare the working of our hand looms with large looms in the woolen mills; the use of the heddle and shuttle; and what the woof and warp really are. What could be better for teaching textiles? Our looms are often borrowed by the sewing teachers to explain the above to their classes. The process of setting up a loom and of weaving also involves accuracy.

These scarfs can be made any length and width, using one, two, three, or four colors. The materials used are as follows:

1. Fleischer's silverglow yarn for both warp and woof.
2. Silverglow yarn for warp and shetland for woof.
3. Teasel brushed wool for both warp and woof.
4. Iceland wool used double for warp and single for woof.

Number one and two make medium weight but warm scarfs; number three, very heavy scarfs, brushed to look woolly; and number four, light weight scarfs, to be worn in warm weather to match sweaters.

The mechanical drawings illustrate the details of the loom, heddle and shuttle. All parts are made of white wood.

WINDING WARP.

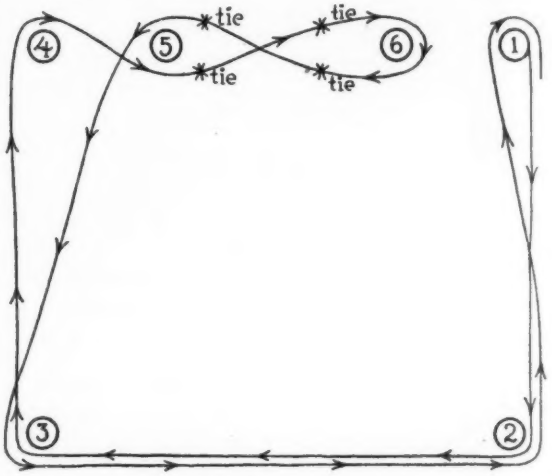
The first step is to plan your scarf as to the length, width, and color, remembering to plan on eight threads to an inch. Thus, if the scarf is to be fifteen inches wide we must wind fifteen times eight threads or 120 threads in our warp. If the scarf is to be fifteen inches wide, and made in squares that means 120 threads,—60 for upper and 60 for lower threads. Wind fifteen of first color; 15 of second color and then repeat fifteen of first and second colors.

In the weaving of such a scarf one must weave enough to make a square of one color then of the other color.

For a 90 inch scarf allow six balls of the silverglow or shetland, four of the iceland and two hanks of the teasel wool.

The warp is wound on large wooden pegs or spikes placed like the diagram below.

Beginning always at peg 1 follow under pegs 2, and 3, over 4, under 5, over 6, returning under 6, over 5, skipping 4, under 3, and 2, up on inside of 1. Then start over 1 for second time, and so on. The important place is between 5 and 6 where our threads must cross to give the

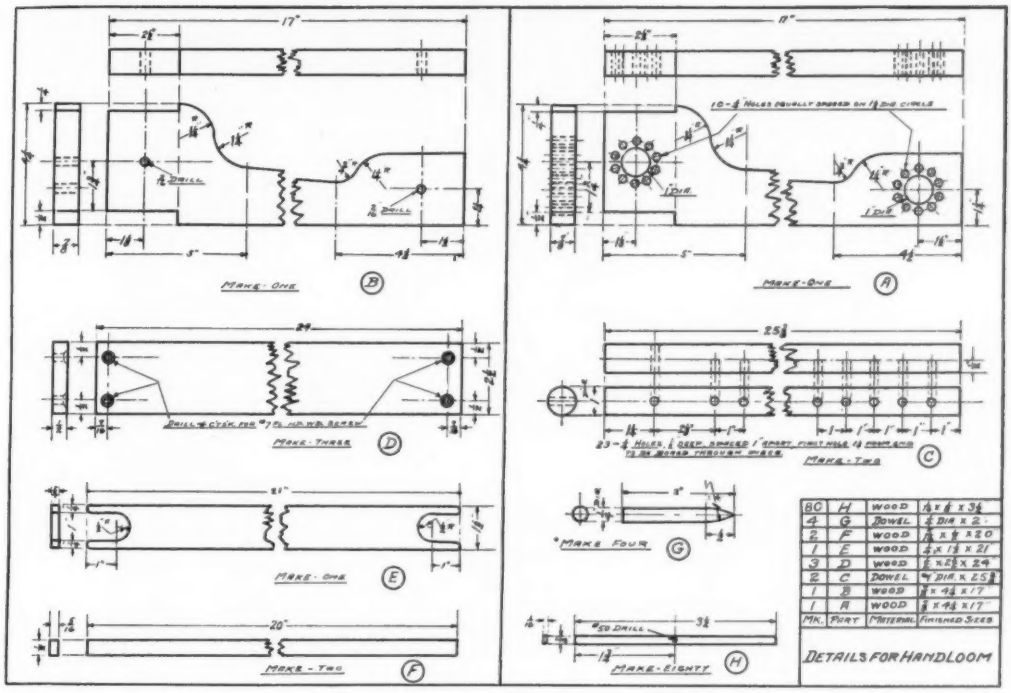


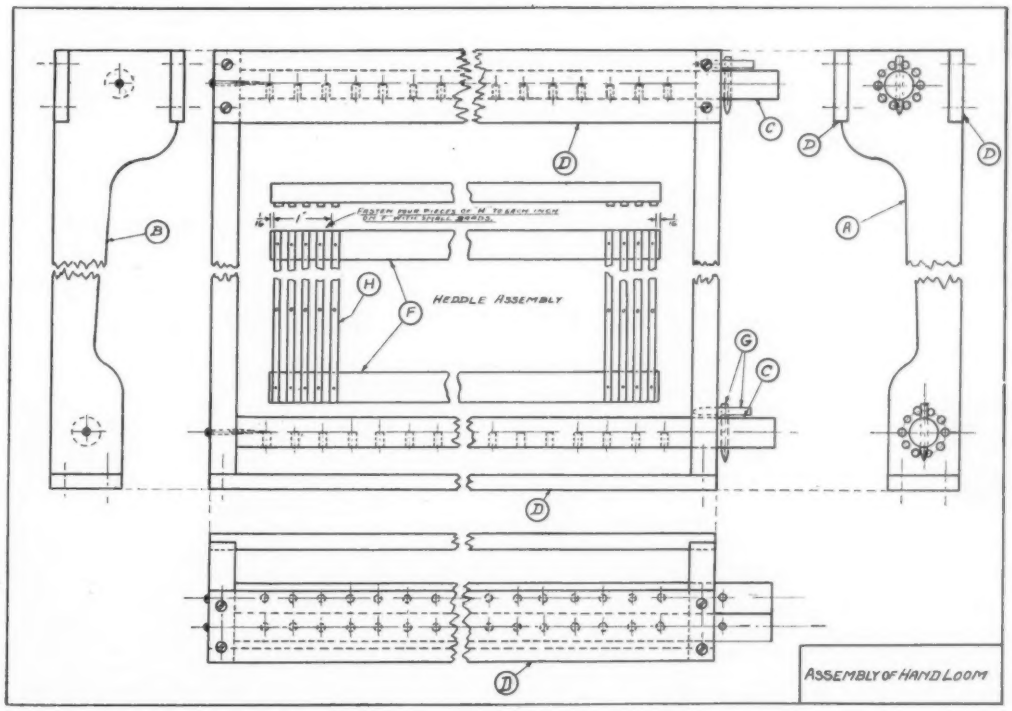
DETAILS OF WINDING WARP.

lower and upper threads for the heddle. It is well to leave quite a few inches between pegs 5 and 6. The length of the scarf will be the distance from peg 1 to peg 6, so plan the placing of the pegs from the length desired.

If a knot should appear in the yarn, break it off and begin again at number 1. Tie with small pieces of yarn upper threads together and lower threads at places marked before taking from pegs. Cut off the pegs at numbers 1 and 6.

To set up the loom, lay the warp on a long table, working with the tied ends. Place the lower threads into the little slits and the upper threads into the holes of the heddle. Put in all the lower threads first, before untying the upper threads at all. Draw these threads through four or five inches and then tie the ends of four upper and four lower threads together in a soft knot. Tuck these knots into the holes on the back roller of the loom and start to roll the yarn on roller, bringing the heddle always down towards the front roller, thus combing out the yarn. When there remains about eighteen inches of the yarn that is not rolled on to back roller, repeat the process of tying four upper and four lower threads together in soft knots, tucking into the corresponding holes on front roller of loom. Roll on to the front roller about six inches of yarn, allowing this for the fringe when the scarf is finished.





DETAILS OF SMALL HAND LOOM USED BY THE AUTHOR'S CLASSES.

You are now ready to weave. Keep the warp threads rather tight. This can be adjusted with the little pegs on the right of the loom.

It is well to weave three or four times with heavy twine or jute, thus separating the threads. The heddle is pulled up, going across one way with the shuttle and is pushed down coming back. This allows the shuttle on which the yarn for the woof is wound, to run through very freely. It brings the upper threads up, going one way, and the lower threads up, coming back. After pushing through the shuttle each time, the heddle is brought right down to the front of the loom, thus pushing the yarn in place.

It is better to weave the first four or five rows tightly as it gives a firm beginning for the scraf. Repeat this at the other end of your scarf also.

ONE OF THE AUTHOR'S CLASSES AT WORK.

When a new shuttle full, or a new color is used, leave four or five inches hang loose. When the scarf is taken from the loom these loose ends are run back into the scarf with a wool needle.

These scarfs can be woven closely or loosely, just as one desires, the heddle being applied accordingly to what is wanted. When eight or ten inches have been woven place a piece of paper under the front roller, removing the pegs at the right of the loom and roll the finished part on the front roller. It rolls very evenly on this heavy paper.

When the scarf is finished, take it off the loom, tuck in the loose ends and make a plain straight fringe by taking an upper and lower thread and tying them in a firm double knot close to the last woven thread of the scarf. Make the fringe even on both ends.

You now have a finished product of real value. Is not something practical what the school children today need?

On these same looms, sofa pillow tops and bags can be woven also.

One picture shows the winding of the warp and also the putting of threads into the heddle. Other picture shows a group of children with finished scarfs and weaving together with boys making the loom.

Unanimity of Effort in Manual Arts

Percy Angove, State Supervisor of Manual Arts, Lansing, Mich.

MUCH has been written and said, with considerable justification, concerning the present status of manual training as it is generally taught, especially in the intermediate grades and junior high schools. Those of us who are closely related to, and have direct contact with, this important phase of general education are led to ask ourselves the question, Is manual training functioning effectively? We are not offering excuses for the subject because it has accomplished that for which it was originally intended, namely cultural development. It has weathered the storm of adversity and is now a recognized essential factor in our curricula. Nevertheless, the question arises, Should we let "good enough" represent the highest point of efficiency, when we realize that manual training can accomplish much more in the future than it has in the past and still retain its general cultural values?

Whenever we speak of manual training it is quite natural for us to think of woodworking, perhaps because of tradition dating from the old Swedish methods of sloyd or because work in wood offers advantages in natural manipulative skill. Handwork in wood was, and in fact still is, taught as a purely cultural development subject, bringing into play the expression of the student through the aid of material things. This should continue to be the aim, but technique and manipulative skill should also receive their due share of attention. Especially is this true in the elementary grades.

Vocational Education—An Incentive.

An impetus has been given to vocational education through state and federal funds as provided for by the Smith-Hughes law. The shops supplying this type of education are naturally located in our larger cities for the reason that the smaller school systems cannot meet the requirements of the law in providing the necessary expense to maintain a vocational education department. The courses taught in shops now organized under the act offer such advantages as will lead the students far into a trade and will definitely equip them to earn a living. This, then, is specialized training. The need for such training is evident, and much time and effort is given to its development. But, because of this, educators are agreed that something must be offered which will lend itself readily to a town of average size and needs.

Woodworking alone does not offer a sufficient variety of experiences. Therefore, courses covering other fields than that of woodwork should be provided.

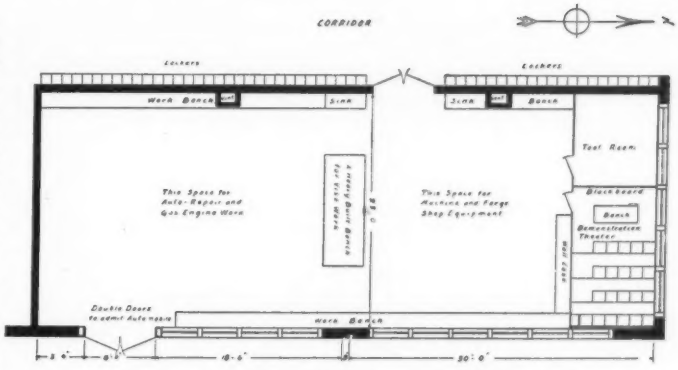
Educators and those vitally interested in social and economic problems throughout the entire country today are seeking to motivate and give a life value to all types of education. Today as never before we feel the need of a closer relation between school life, home life, and community life. Even though manual training and vocational education have two different objectives, they can be so definitely linked that the great mass of students may be better prepared to cope with life's ordinary activities.

Judging by the definitions of education as offered by leading educators, it would seem that an immediate purpose of education is to prepare for the right kind of adjustment. Therefore, a general knowledge of the real tasks of life, especially with actual performance in at least a few of its processes, would act as a definite means to an end. Manual training, with industrial tendencies, can materially contribute to this richer, fuller and more complete type of education.

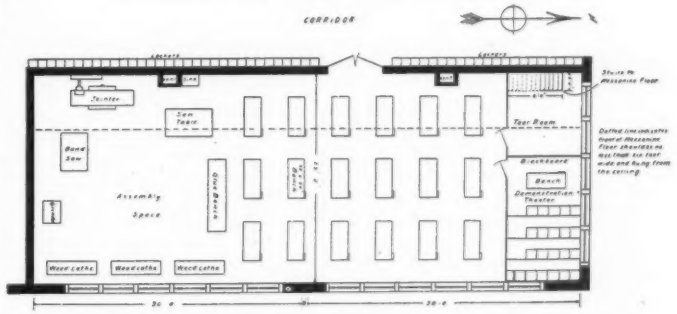
Means of Uniformity.

What is now known as the "general shop" will make the work of manual arts more uniform for various reasons. Definite courses of study should be prepared and followed, allowing for teacher initiative. Methods of instruction should materially differ from those ordinarily used. Standards of accomplishment must be established and maintained so that the work throughout an entire state may be more in common. All this, with a thorough knowledge of the subject matter on the part of the teacher, is certain to make the work function more effectively.

The general or composite shop idea is being accepted quite generally in many of our progressive cities of medium size as well as in our smaller communities. In fact, there is a question as to whether or not it is possible to have successful tryout shop courses in the high school, without previously having allowed the pupils to have an extensive rather than intensive period of exploration in the intermediate grades. The separate specialized shop is more adapted for reasons before mentioned to our larger cities and towns and my only reason for mentioning it is because manual arts should bear a close relation to it. It furnishes the necessary foundation for a more definite procedure.

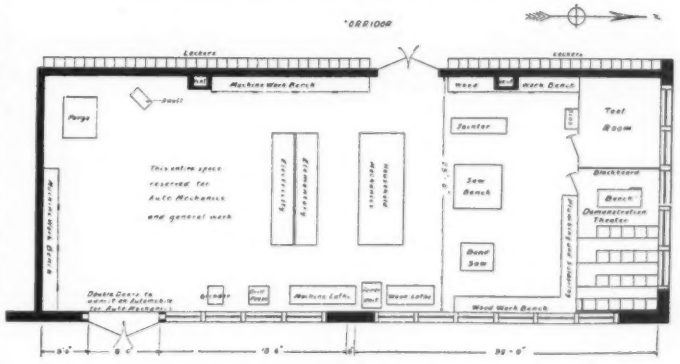


A STANDARD AUTO-MECHANICS AND MACHINE SHOP.



GENERAL SHOP FOR WOODWORK, HOUSEHOLD AND FARM MECHANICS AND ELEMENTARY ELECTRICITY.

NOTE: The demonstration theater may be used as a finishing room if a separate room is not available. The mezannine floor may be used for storage.



COMPLETE GENERAL SHOP FOR WOODWORKING, METAL WORKING, AUTO MECHANICS, HOUSEHOLD AND FARM MECHANICS.

Household mechanics and elementary electrical applications in the home are courses that are fast becoming very popular because they offer a greater variety of tool processes and experiences. They are adapted to large as well as small towns and villages and can be satisfactorily taught in a general shop or in the ordinary manual training shop. Therefore, it is of special interest to all manual arts teachers, regardless of the size of the community, and especially because additional space is not absolutely necessary. However, larger towns are beginning to incorporate these courses as an integral part of the industrial education program, especially in the intermediate grades where the objective is extensive rather than intensive training and where the separate specialized shop is used for specialized training. In some places two separate shops are made possible without allowing duplication. The woodworking and allied activities are located in one, while the metal working and allied activities are located in another.

Expense Very Small.

There seems to be no serious difficulty in providing for a course in household mechanics and elementary electrical aplications in the home, even in small communities, because the expense is so small that it offers no great problem. This, after all, is a strong determining factor. In the first place, the regular woodworking shop and equipment can be satisfactorily used with some additional equipment and supplies. As implied by its name, household mechanics, the subjects taught relate definitely to the home and community, coming under the building trade groups and naturally embracing the following—carpentry, inside wiring, plumbing and heating, inside finish and cabinet making, painting and decorating. Based upon this very practical shopwork, technical instruction could be drawn from a numerous and diversified line of occupations, with excellent opportunity for offering vocational guidance information for all trades related to this particular phase of shopwork, something like twenty trades or specific occupations being represented.

The diversified line of activities offered will enrich the courses and the knowledge of the pupils as well as offer

the advantage of giving each student a better opportunity to find out for himself just where his ability lies.

The Teacher and Methods of Instruction.

For instruction in such a shop, different methods than those which are usually pursued must be employed because of the number of units to be taught. In the first place, the teacher must know his subject matter. Too often we find in our manual training shops teachers who would be more efficient in teaching the academic subjects, because they lack concrete and practical experience with industrial or semi-industrial conditions. True, the shop teacher should be a good pedagog but he should add to this, actual contact with and experience in the performance of life activities relating especially to his chosen field. This will give him a broader vision which must naturally tend to make any form of shopwork effective. There is no reason why a teacher of ordinary ability cannot make a successful teacher of these courses because he can easily avail himself of material already at hand. In growing up with the work, he will make as near an ideal teacher as it is possible to have. In other words, what is lacking in qualifications may be acquired.

After knowing the subject matter, the next thing is to impart it to others in such a way that the class as a whole will acquire the maximum of knowledge. How can this be done? First, by determining the number of students and grouping them so that the average students will work along with those showing more native ability, because in order to teach the courses successfully group instruction is necessary. These groups should be organized to rotate, thus keeping the complete equipment continuously in use and avoiding loss of time. After the class has been in operation long enough, leaders might be developed to assist the teacher with the various groups and give him more time for general supervision, perhaps assisted by a student foreman. Each student should be furnished with lesson sheets, so that after the demonstration he can work out his own problem to the best of his ability, the lesson sheet acting as his guide. Textbooks, the city building code, and any literature pertaining to the work should be available for reference, since the different subjects are a part of the whole. The class should be encouraged to bring material from home to repair and to do such repair as is deemed advisable for the school system. In this connection, however, caution must be used so that the work will not be so commercialized as to enter the field of specialization for which vocational education alone is intended. Trips to buildings in process of construction should be encouraged in order that the work may have a practical community significance.

It is a generally accepted fact that woodworking alone does not meet the need. Yet it is predominant in small-town schools and even in some larger schools, where only one or two courses in manual training can be accommodated, either because of a lack of sufficient funds or an overcrowded curriculum. In this case manual training is usually given the least consideration among the other subjects offered.

I do not wish to infer that woodworking has no place in our courses. Most emphatically it has. The results in most instances have been very gratifying indeed, and our only reason for not bringing about a change is because of a realization that it would be disastrous to eliminate the course. Yet there is no excuse for offering three or four years of woodworking when the subject can be satisfactorily taught in one-half that time. Therefore, the good of the old may be retained, bearing in mind that the objective is general education and not trade training and provision is made for other courses so that a greater fund of knowledge may be acquired because of having had a greater diversity of experiences.

I would have it thoroughly understood that the general education aim should be the dominant one in the intermediate grades and junior high school. In vocational schools and classes the vocational aim should be the dominant one but since vocational education is based upon, and is an extension of general education, the relation should be such that there cannot possibly be an abrupt break between the two. Naturally this appeals to the manual arts teacher, because if he is alive to the best interests of his pupils and community he will seek to make manual arts motivate in making the industrial life of the community felt in the school, particularly in his classes. In other words, he will see that manual arts will accomplish that for which it was originally intended. But one thing more, he will localize his work in such a way that it will no longer be classed as a purely expressional subject or one which is followed without a serious purpose, but as one which will serve as a possible means of preparation for at least some of life's activities. It will help the student find himself, it will give him a broader conception of the real tasks of life, and perhaps it will be the means of definitely deciding his life vocation. This can be done and still maintain its original purpose even to better advantage. This, then, is pre-vocational training in its broader sense, tending to bridge the gap between manual training and industrial education, offering an excellent foundation for vocational education.

The Hand Forged Spoon

Louis J. Haas, Director Therapeutic Occupations, Bloomingdale Hospital, White Plains, N. Y.

ONE only has to say, "this is a colonial spoon," and instinctively the observer touches it with reverence, feeling that he has in his hand an object which, besides the rich interests of associations with the past, embodies within its graceful contour certain qualities, deep mysteries to him.

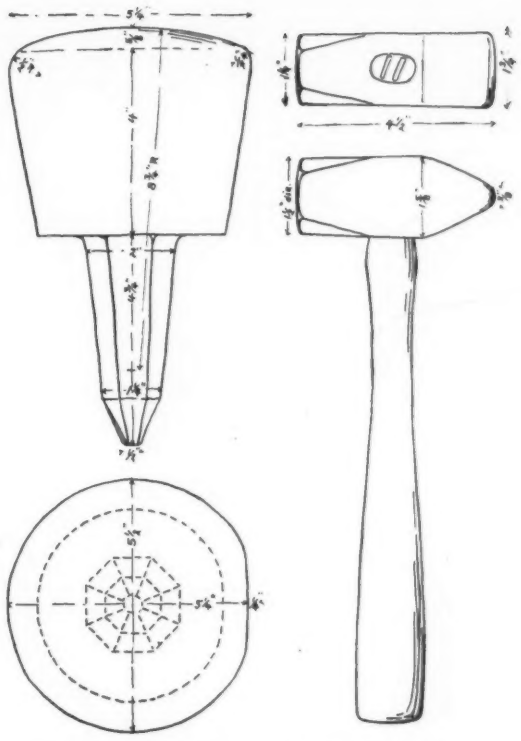
Just what is a colonial spoon, besides an old spoon worn by many uses which are now but sacred memories? It is usually a spoon made of coin silver, which is a lower quality of silver than that known as sterling. The toughness thus acquired may have added much to the life of the spoon, but this is doubtful, as many other things contributed to this. All colonial spoons were hand made by craftsmen who gave careful study to the design, proportions, and the balancing of the parts of the spoon not only according to weight, but also visual symmetry. The spoons were forged into shape from a silver ingot or bar. Therein lies the secret of the qualities we admire in the colonial spoon. The secret of their wonderful wearing qualities is explained by the fact that the men who made them were skilful in the art of forging spoons.

Fine spoons can be made by machinery today, but in this multiple production of a design, the spoon loses the individuality and charm which only the hand made thing has. It is also true, that no machine can give to the handle and bowl alike that even tempered condition of the silver, which only comes through the skilful manipulating of the hand-forging process, and spells life for the spoon and added satisfaction for the user. Because this is true, there are craftsmen making spoons by hand today. Some of these hand made spoons are being made by sawing them out of heavy plates of silver. The spoons made thus never compare favorably with the old spoons, and therefore, the best spoons made by present-day craftsmen are forged by the following process from small ingots or bars of sterling silver.

The special equipment needed for spoon forging is very simple, consisting of a spoon-forging anvil, a forging hammer, a set of spoon stakes, or dies, and the lead matrixes in which the bowls of the spoons are struck up and formed. Beside this special equipment certain tools found in every art metal work shop are needed. These are a foot bellows and blow pipe, shears, files, a scraper, a burnisher, a saw frame and blades, a set of gravers and sometimes a stick of scotch stone, and finally a good polishing lathe with brushes, buffs, felt wheels, scratch brush wheel, and wash out brush.

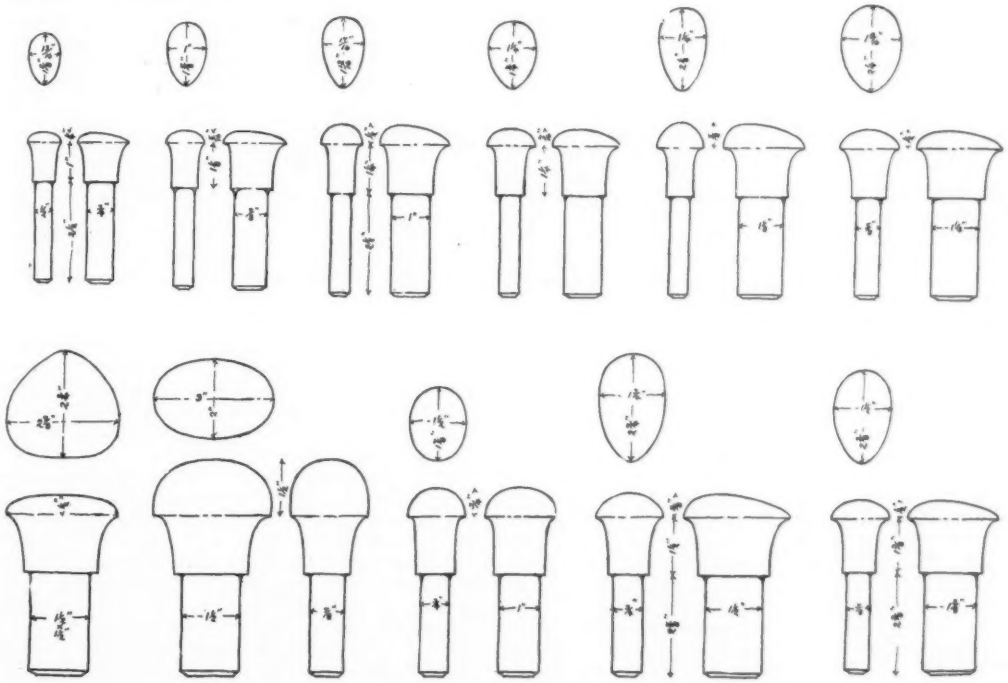
The spoon forging anvil and stakes are unusual pieces of equipment, and can only be procured from some craftsman who has had his own models, from which a new set may be cast. The anvil is cast in malleable iron and after the face, edges and heel of the anvil are polished, it is set up in a log, so that the face of the anvil is on a level with the worker's elbow when he is standing.

Drawing No. 1 shows the details of a satisfactory spoon forging anvil and explains how it is set up. The forging hammer is shaped like a small sledge, and should weigh with handle, between 2½ and 2¾ pounds. At one end it has a round face that is very slightly domed, the edges having been rounded off. The doming of this face is so slight, that some would say it is perfectly flat. The shape of the other end is what is called a cross pein. The pein is at right angles to the handle, is about 5/16" wide and rounded off on the edges and ends as shown in drawing No. 1. The spoon stakes are the exact shape and size of the inside of the bowl of the spoon each is designed to strike up. One must be had for each type of spoon bowl it is desired to shape. A set, usually consisting of from ten to fourteen stakes, includes all sizes and styles from the tiny coffee spoon, to the large table or vegetable spoons, as well as the ladles. These stakes have the faces perfectly shaped and highly polished and are cast with strong shanks to facilitate the striking up of the spoons. See drawing No. 2.

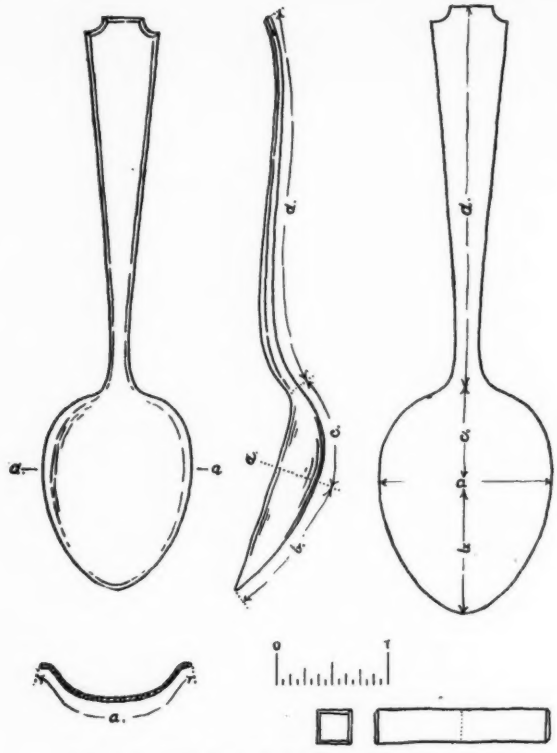


1. SPOON FORGING ANVIL AND FORGING HAMMER.

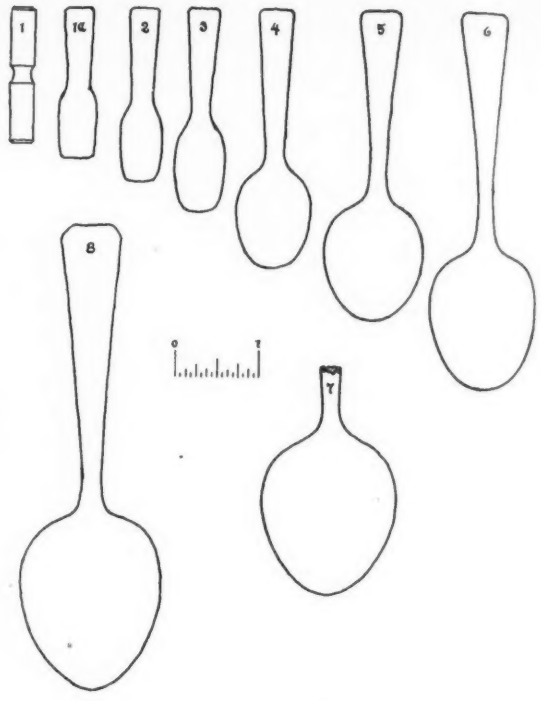
To make a hand forged spoon, the craftsman proceeds thus: First, he carefully designs his spoon, showing the contour of both the full view of the spoon and the silhouette, and finally, a cross section through the deepest part of the bowl. From the dimensions these drawings supply, the design of the flat pattern from which the spoon will finally be struck up, is made. Study of the drawing No.3 will show this pattern is the exact length of the flattened contour of the silhouette, while the width of the bowl is



2. DETAILS OF THE PATTERNS FOR A SET OF ELEVEN SPOON STAKES.



3 AND 5. THE DESIGN AND PATTERN FOR A HAND FORGED SPOON.



4. RECORDS KEPT OF THE DEVELOPMENT OF A HAND FORGED SPOON.

that of the flattened out cross section. This pattern is what the spoon blank will be, after the forging has been completed and the shape has been trued with the file. Before the bar of silver reaches this proportion, thickness, and shape, it must pass through eight stages of growth.

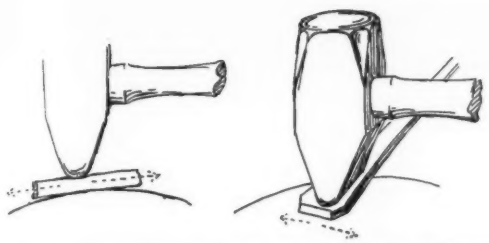
Having the design and pattern, the next thing to decide is the exact proportions of the bar from which the spoon blank, or pattern, may be forged. This bar must be just large enough to produce the spoon blank, with the minimum of filing. Experience decides what the proportions of this bar shall be to produce any given spoon. No formula can be given by which the size of the bar can be decided, but a comparison of the new design with the records of similar spoons made, aids the craftsman in deciding the proportions of the spoon ingot. It will be seen, therefore, that it is very important for the worker to keep a complete record of the development, along with the design of every spoon he makes. It is also important that when the spoon is completed the results should be noted on the record sheet. Thus if the spoon blank was too large, just large enough or a little small,—note this fact for future reference. The drawing No.4 shows how these records are kept. It is only through these carefully kept records that designs can be reproduced.

Having decided as suggested, that it will take a bar of silver 5/16"x5/16"x1⅝" to produce the spoon blank shown in drawing No. 5 the course to pursue is as follows: First, cut the bar to length, file the ends square and then chamfer all edges just enough to take away the sharpness. Anneal the bar with the blow pipe, heating it until just the slightest trace of pink can be seen beneath the whitish surface of the hot silver bar. Care must be taken not to overheat the bar, as it would burn the silver, or sweat it out of shape. The bar must be heated to the proper temperature to leave it quite soft; the color just mentioned is the surest guide. Having completed the annealing, the hot bar may be dropped into a pickle bath composed of one part of sulphuric acid in from fifteen to twenty parts of water. The bar is removed from the pickle with a pair of copper tongs, never use iron tongs, as iron spoils the pickle; rinse in a second stone jar containing clear water and dry in a box of sawdust.

The bar is now apportioned off to handle and bowl. Here again experience and the records of previously made spoons compared with the present design must be the guide. A pencil line is placed around the bar to denote this. Now before starting the forging, record the size of the bar by tracing around it with a sharp pencil upon the sheet containing the design and spoon blank. The first step is the necking of the bar. Holding it between the thumb and fingers of the left hand, place it over the spoon forging anvil, so that the heel of the anvil supports the bar at the point marked to be necked, strike a blow with the pein end of the hammer across the bar and on the line. Turn the bar over and strike a similar blow, and repeat this until the bar has been necked on all four sides or faces. Record the results and proceed to the next operation.

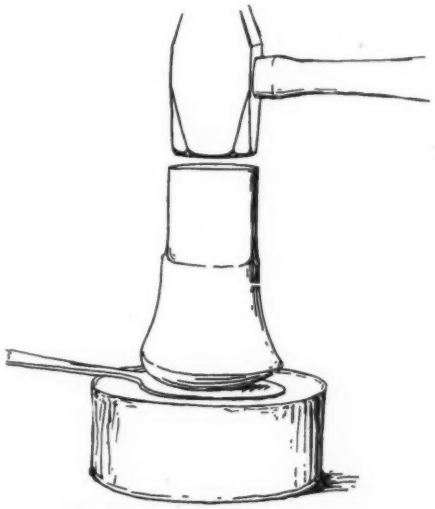
Holding the bar by the bowl end with the handle section supported on the anvil, the heel of which rests under the neck of the ingot, strike a series of blows, each touching from the neck out to the end of the handle. Turn, and repeat this process on all four sides or faces of the handle end of the bar. These blows are struck with the pein cross ways of the handle. It will be observed that this has reduced the thickness, while lengthening the spoon handle. This demonstrates the one principle controlling all forged work; that is, metal compacted between two arcs by pressure, or a blow struck, on one of these surfaces, travels away from the point of tangency in both directions. See drawing No. 6. The skilful application of this principle makes it possible for the craftsman to accurately control the movement of the metal.

The bar is next held by the handle with the spoon section lying upon the anvil. Strike a blow with the pein of the hammer, running with the length of the bar, placing the blow squarely in the middle of the bowl section. Strike



6. EXPLAINS HOW THE METAL IS COMPACTED BETWEEN THE HAMMER AND ANVIL, TRAVELING IN DIRECTIONS INDICATED BY THE ARROWS.

blows on either side of the first one until the edges are nearly reached; then turn the bowl face down and repeat this operation. The bowl is now turned up on edge, and one or two blows are struck with the flat end of the forging hammer to square back the edges. A tracing is made to record the growth of the bar. Anneal, to remove the temper acquired in manipulation, pickle, rinse, and proceed with the forging.



7. STRIKING UP THE SPOON BOWL.

The process just described is repeated, with the exception of the necking which is dispensed with. The annealing, pickling, rinsing and drying, must follow each completed step in the forging to prepare the bar or ingot, for the next step of its development. No further reference need be made to this fact. It will be also understood, that each time the above work is completed, the worker traces and records the development before proceeding with the forging.

In the fourth step or stage, the process is somewhat changed. In forging the handle, the pein end of the hammer is used, placing the blows crosswise, starting at the neck, and continuing to the end of the handle upon the front and back of the handle.

In forging the sides of the handle the procedure changes in this respect. With the heel of the anvil placed close up to the neck of the handle, start with the blows here quite heavy and decrease their weight as they progress toward the end of the handle, discontinuing them altogether before the end is reached. Repeat on the other side, and then square back the remaining portion of the handle with light blows from the flat end of the hammer.

The blows used in forging the bowl are placed as described with the exception that they do not quite reach to the neck. This reserves a section of the bowl a bit thicker than the rest. Now, over this section two groups of blows are placed, both upon the front and back of the bowl with the pein crossing the blank at about 45 degrees each way. This raises the shoulders of the bowl as the drawing of this stage shows.

It will be seen that the spoon blank is commencing to develop form. Turn the bowl upon edge and square, or block back, this surface with a few light, carefully placed blows of the flat end of the hammer, and the forging of this step is completed.

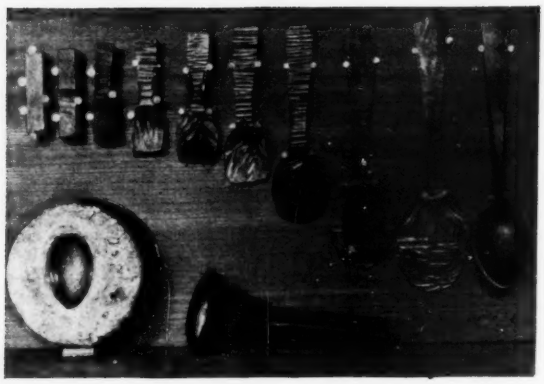
It will be noted that in forging the bowl, and even the end of a wide handle, that the two face surfaces seem to travel at a greater rate than the metal between; if this is allowed to continue, these overhanging edges will meet, and finally develop into a crack or cleavage of the surface of these narrow sides. The squaring back eliminates this danger, and must be carefully applied at the end of each forging step to all surfaces requiring it. These surfaces are the edge of the spoon bowl and such portions of the sides of the handle as require no further manipulation with the pein end of the hammer.

Step No. 5 is a repetition of the process just described. Step No. 6 is also a repetition of steps No.4 and No. 5 with these changes: In forging the face and back surfaces of the handle, the blows become a bit heavier as they near the end. This tends to graduate the thickness from the heavy neck out to the thinner end, and also starts the end to taking on a rounded or peaked shape. In forging the bowl, a section near the tip end as well as the neck is avoided in placing the longitudinal blows. This tip of the bowl is lengthened by a number of blows with the pein end of the hammer, placed cross-wise of the length of the bowl. This procedure is followed in the forging of the back and front of the bowl. The bowl edges and sections of the sides of the handle, now are squared back for the last time with the flat end of the forging hammer.

In step No. 7, the handle is treated as just described for step No. 6, the sides being forged as much as necessary to aid in keeping the handle to the proper contour and width. The bowl is treated on one face only, as described in step No. 6, while on the other face the blows of the pein end of the hammer are placed across the spoon to lengthen the bowl. Step No. 8 is a repetition of step No. 7, with this in addition: Should the handle need widening in any place a few blows may be placed, paralleling the length of the spoon, to accomplish the result desired. Should the contour of the bowl be insufficient to contain the pattern of the spoon blank, it may be enlarged by placing a few blows with the pein end of the hammer where, and in the direction indicated. This completes the forging part of the development of step No. 8.

Now carefully anneal just the bowl portion of the spoon. Every effort is made from now on to retain, and even increase the temper of the neck and handle of the spoon. With the flat end of the forging hammer, planish the bowl of the spoon, removing with these flat smooth facets all evidence of the pein marks remaining from the forging process. After this has been accomplished, again carefully anneal only the bowl of the spoon, then planish the handle front, back and sides, to remove all the marks of the pein end of the hammer. The spoon blank is now ready to be filed true to the pattern. The center line of the blank is marked in pencil and the pattern is carefully transfered to the metal. The pencil or carbon line is now traced with a scriber, and the blank is filed true to the line.

It will be noted that the blank is in the proper condition for the striking up process. The bowl of the spoon blank is quite soft from the last annealing, while the neck and handle are tempered to the condition of spring steel by the manipulation received since last annealed. If the planishing has been skilfully done, the bowl may be struck up without further preparation. Sometimes it is well to polish the face, which is to become the inside of the bowl, upon the lathe, with the buff and tripoli before striking up the bowl.



A SPOON AND ITS "ANTECEDENTS."

To prepare the matrix in which the bowl is to be struck, proceed thus: Take a can about 3" in diameter and cut it down to 2" in height. Take a quantity of lead sufficient to fill the prepared can, put it in an iron ladle, and melt over a blow pipe. Now heat the face of the spoon stake, and holding the stake in the crucible tongs, face down, press into the can which has been nearly filled with the molten lead. The stake is pressed into the lead until the lead rises to the edge of the stake, which corresponds to the lip of the spoon. Hold the stake firmly in exactly the same position until the lead cools and sets, when it may be removed. When the matrix is cold, place the bowl of the blank over the hollow, put the stake or die in exactly the right position, and holding it firm, strike several blows with the hammer until the bowl has been driven up into shape. See drawing No. 7.

If the bowl is very deep, it is necessary to strike it up in stages, or the metal will buckle. Drive it as far as the metal will stand, then shape over the stake with a mallet and strike up again in the matrix. It is necessary with some large spoons to even partially anneal the bowl of the spoon, before the striking-up process may be completed. Care must be taken to avoid drawing the temper from the neck and handle of the spoon and to anneal at a stage where sufficient work follows to properly temper the bowl.

The lip of the bowl is now filed level and true. The edges of the neck and handle are carefully filed, and if the design calls for it, the edges are chamfered and the spoon is burnished with a steel burnisher, to remove the file marks. The spoon handle is now shaped over a hard block of wood with a wooden mallet until its profile corresponds to that called for by the design.

The spoon now receives its final cleaning in the pickle. This may be accomplished by boiling the spoon in a copper pan filled with pickle, or the spoon may remain in cold pickle over night. Finally the spoon is polished, first with a bristle wheel and tripoli, then a cloth buff and the same abrasive. Wash the spoon thoroughly in hot water to which has been added a little laundry soap and a little ammonia. The spoon may be boiled in this solution or washed in it with the aid of a washout brush. It now receives a high polish, using another bristle wheel and then a cotton flannel buff which are reserved for this purpose. The abrasive used is hard stick rouge. The use of a flat felt wheel and rouge may facilitate polishing small chamfered surfaces, when it is desired to retain the sharp edges. The spoon is given a final washing in a fresh solution as described, and it is complete.

Should a dull finish be desired instead of the bright finish, which is the result of the above described process, the polished spoon is simply brushed thoroughly with a washout brush, fine pumice and water, then rubbed dry with a soft cloth.

When it is desired to make a number of spoons exactly the same size and after the same pattern, they are forged simultaneously. That is six, twelve, or any number of bars are cut and prepared for the forging. All are put through the first step of the forging, and then are prepared for the second step. This course is followed throughout, all spoon blanks being finished and filed true to shape before any are struck up. This course, if carefully pursued, guarantees that all the spoons will be alike and will stack; no other method will. The time saved in working a number of bars together is no small item.

No very definite rules can be given as to the designing of good spoons. The designer should study good spoon patterns. The contour must be pleasing; the neck while slender, must be wide enough to look strong as well as actually be strong. The handle must be so formed or proportioned as to present a partial visual balance with the bowl. The neck must be thick enough to appear strong and actually contain a reserve of strength, without being crude or clumsy. The tapering thickness from this point should be reduced in a graceful way to the end of the handle. And last, but quite as important as the above mentioned points, the spoon should be balanced by weight. The well planned spoon, if supported at the highest point of the curved neck, should balance perfectly, the handle against the bowl.

It will often be observed in polishing a silver spoon that certain dull places appear on its surface. If these are not removed the spoon will discolor rapidly. The areas of dullness, almost like finger marks on the bright surface, are commonly called firescale. This fire scale is acquired during the annealings to which the ingot is subjected, during the forging process. Sometimes it may be wholly removed by a little extra work with the bristle wheel, buff and tripoli, but if the scale is in deep, the surface of the spoon would be ruined before it could be removed thus.

A good deal of the fire scale can be removed by leaving the spoon for a longer time in the final pickle bath. Some workers use a stripping solution composed of cyanide of potassium and water, in which the piece is supported and stripped of the scale by the reverse of the usual electroplating process. While all of these methods remove the scale, it is obvious that the spoon is losing weight, therefore the better method is to prevent the scale. The scale is the result of oxidation due to the silver coming in contact with the oxygen in the air when at a certain tempera-

A FORK AND SPOON MADE BY THE AUTHOR.

ture. Silver which is free of scale, will acquire none if this can be avoided. It has been found that a mixture of equal parts of powdered borax and yellow ochre in water, painted thinly over the entire surface of the ingot before each annealing, will protect it sufficiently from the air to prevent oxidation or firescale. This coating makes it more difficult to observe the tone of the silver while annealing, and the beginner would do well to forge his first spoon without its aid. Having acquired sufficient experience in annealing, then this protective coating may be used with comparatively little fear of over-heating the ingot and losing the spoon.

Notes on School Shop Plan and Equipment

Chas. H. Stone, Julian, Calif.

THE reason for presenting this shop plan, is to bring industrial teaching before the smaller, and rural high schools. All will not agree with this plan, and many will ask for a different equipment. The hope is that a discussion may follow.

The thought that started this was the need of a plan for a one-teacher shop. The floor space is large for one teacher but it is hard to crowd the industries that should be taught into a smaller space.

Where economy in building is necessary, I would prefer to cut off the drawing room end of the building, and teach drawing in the wood room. I have found it very difficult to get good work from a drawing class, apart from the influence and atmosphere of the shop.

It will be noted that I have included drawing instruments, as a part of the regular equipment. Drawing is essential, and should be provided for, as a part of the shop.

The blueprint outfit is not essential, although it adds interest to the work, and should be of use to the whole school.

This equipment does not pretend to be complete, but is enough for a start, and gives the boys practice in the industries they will run up against, and teaches them the possibilities and limitations in the materials they have to work with.

There are tools that might wait for a more convenient season; the more expensive of the sheet metal machines, the three lathes, the acetylene welding outfit, and the power hammer: cutting out about $900. Cement work should be included, most of the tools being made by the boys. Nail sets, cold chisels, punches, tongs, and many of the small tools should be made by the boys. Special tools, for the repair of school busses, should be included in the equipment.

Cost of drawing tables and shop benches, have not been included in the estimate. The boys can make these, if it is thought best. Temporary benches would have to be put up, and drawing would have to wait for tables and boards to be made.

Getting out good work, without all possible tools, brings out the boy's ingenuity, and is usually the proposition he is up against, around the average home, and on the ranch. I believe in the plan, not a new one, of letting the boys bring repair work, and even get credit for work done at home, under right conditions.

Ceilings in the shop should be at least 14 feet, and the "saw tooth" skylight should open for ventilation. I have indicated no method of heating.

SCHOOL INDUSTRIES SHOP EQUIPMENT.

Drawing Tools:

10 6″ Compass sets
10 Arch. Scales 12″ triangular
12 T Squares, mahogany, ebony lined, 24″
10 Triangles, Cel. 45, No. 8
10 Triangles, Cel. 30 x 60, No. 9
10 Ruling Pens, 4½″
10 Bow Pens, 4″
10 Bow Pencils, 4″
10 Bow Dividers, 4″
4 Cel. French Curves, Nos. 11 and 13
2 Protractangles, 6″ ..... $ 75.00

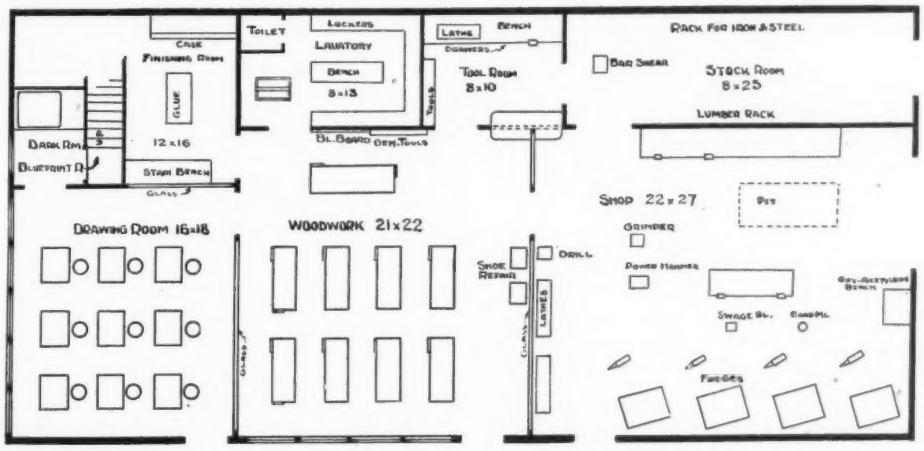
Woodworking Tools:

10 Claw Hammers, Adz Eye, bell face, 12½″
10 Try Squares, 10″, Stanley No. 20
10 Marking Gauges, Stanley No. 165
10 Rules, Stanley, 2 fold, 2 foot, No. 18
10 Block Planes, Stanley 220..... 30.00
10 Bench Brushes

5 Smooth Planes, 8″, Stanley, 603
5 Jack Planes, 15″, Stanley, 605½
5 Back Saws, 10″
5 Sets Chisels, each ¼″, ⅜″, ½″, 1″, Buck, socket firmer 60.00

12 Hand Screws, 10″, No. 808
6 Bar Clamps, 4 ft.
6 Oil cans, ¼ pt., wide mouth, No. 12..... 50.00

3 Oil Stones, comb. No. 29
3 Sets Screw Drivers, No. 75, 2½″, 4″, 6″
3 Pliers, comb. 6″
3 Braces, 10″ ratchet, No. 965
3 Countersinks, rose, 315½
3 Screw Driver Bits, ⅝″, Stanley
3 Bevels, 10″, Stanley, No. 25
3 Coping Saws, rev. blade, No. 110



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NOTE - SAW-TOOTH SKYLIGHT - FACING NORTH - OVER ALL ROOMS - EXCEPT DARK ROOM. BLUEPRINT ROOM ON ROOF.

LAYOUT FOR A GENERAL SHOP.

3 Spoke Shaves, Stanley, 54	
3 Rip Saws, 24″, 6 pt. D 8	
3 Hand Saws, 20″, 10 pt.	
3 Sets Gouges, S. F. No. 41 Buck, ½″, ¾″, 1″	
3 Rules, 3 ft., Stanley No. 80	45.00
3 Floor Brushes	
2 Rabbet Planes, Stanley No. 10¼	
2 Sets Auger Bits, ¼″ to 1″ R. J.	
2 Sets Auger Brace Drills, 2″ to 12″	
2 Sets Chisels, Buck S. F., ¼″ to 1″	
2 Compass Saws, 12″, No. 2	45.00
6 Vises, Abernathy, W. W. No. 70 D	
6 Vises, Abernathy, No. 80 D	
2 Steel Squares, A. C. Nicholl No. 100	
1 Saw, Hand, 26″, 8 pt.	
1 Saw, Rip, 28″, 5½ pt.	
1 Combination Plane, Stanley, No. 45	
1 Jointer Plane, Stanley, 22″, No. 607 C	
1 Expansive Bit, Steere No. 1	
1 Miter Box, Stanley No. 358	
1 Nest Saw, Jennings No. 30	
½ doz. Turning Saw Blades, 14″ x 3/16″	
1 Back Saw, 14″	
1 Saw Vise, Duston No. D 3	
1 Saw Set, Morrell Special	
1 Hand Drill, Miller's F., 5 M	
1 Breast Drill, Miller's No. 118	
1 Bench Drill, Miller's No. 210	
1 Set Morse T. Drills No. 5	
1 Level, 30″	
1 Hand Axe, Hunt No. 2	
1 Putty Knife	
1 Set Crescent Wrenches, 4″, 6″, 8″, 10″	
1 Set Pliers, Thin, Side Cut., End Cut., Round Nose	
1 Tool Grinder, Hand, American No. 3	
1 Grinder Head, 2 8″ wheels	
1 Hand Vise, Stearns No. 21	
2 Vises, No. 2½ Prentiss	
1 Vise, No. 1 Prentiss	
1 Vise, Woodworkers, Monarch No. 59	270.00
4 Forges, Buffalo No. 650	
4 Anvils, about 120″, with hardie to fit	
4 Hammers, 2¼″ ball pien	
4 Hammers, 1″ ball pien	282.00
2 Sledges, cross pien, 8″	
2 Leg Vises, 5″, No. 70	
2 Hand Hammers, 3″	
2 Hot Cutters, 1¼″	
2 Cold Cutters, 1¼″	
2 Flatters, 2½″	31.00
1 Set T. & B. Swages, ⅜″ to ¾″	
1 Set T. & B. Fullers, ⅜″ to ¾″	
1 Band Mandrel, small	
1 Swage Block, medium	
1 Bolt Clipper, 14″, O. K.	
1 Set Taps and Dies, for radio	19.00
Sheet Metal Work:	
4 Snips, St. P. S. & W., 8″	
4 Snips, curved, St. P. S. & W., 8″	
4 Riveting Hammers, Maydole No. 295, 8 oz.	
4 Pliers, flat, 7″	
4 Files, flat bast., 10″	
4 Rivet Sets, 6″	29.00
2 Fire Pots, Clayton & Lambert	
2 pairs Soldering Coppers, 1″	
2 pairs Soldering Coppers, 1½″	
1 Gasoline Torch, Clayton & Lambert No. 38	
1 Vise	42.00
1 Turning Machine, small	
1 Burring Machine, large	
1 Wiring Machine	
1 Crimper and Beader, Niagara	100.00
1 30″ Squaring Shear	111.00
*1 Slip Roll Former, 2″ x 37″	39.50
*1 30″ Keystone Adjustable Bar Folder	72.50
1 Hollow Mandrel Stake No. 0	
1 Creasing Stake, with horn	
1 Blowhorn Stake	38.50
1 Bench Shear, Niagara No. 1	8.00
1 Bench Plate, No. 1	11.50
1 Cornice Brake, No. 4, 8 ft.	188.00
1 Set Steel Letters and Figures, ⅛″	
2 Glass Cutters, turret and circular	
1 Caliper, Micrometer, Starrett's No. 201	
3 Calipers, 6″, 8″, 12″, Starrett's No. 26	
2 Calipers, 5″ outside, sp. nut, B. & S. No. 811	
2 Calipers, 5″ inside, sp. nut, B. & S. No. 812	
2 Dividers, 5″ and 8″, B. & S. No. 810	
1 Protractor and Square Set, 12″, B. S. No. 425	
2 Plumb Bobs, 8 oz., Standard No. 7777	31.00
2 Shoe Tapping Outfits	10.00
*2 Wood Lathes (estimate)	130.00
*1 Engine Lathe, bench, 9″ x 30″	162.00
*1 Power Hammer, Little Giant No. 50	210.00
*1 Oxy-Acetylene Outfit	75.00
Total	$2,165.00

*Tool that could wait.

There are some tools that should have been added: Standard Taps and Dies—¼″ to 1″. Standard Set of Pipe Foots—Vise, Dies—¼″ to 2″—Cutter, Pipe Wrenches.

SHOP VS. SCHOOL TRAINING.

Herbert D. Harper, Murray Hill Vocational School, New York City.

The need of good training for the youth of this country in the various trades necessary to the well-being of the people is self evident. Newspapers and trade magazines report a shortage of properly prepared apprentices in nearly all trades. Although there is an unanimity of opinion in regard to this, there is a great division of opinion as to the best way of overcoming this shortage of properly trained mechanics and artisans.

In all of the large communities of this country there are schools which provide for the best type of instruction in these necessary trades, but in reading the articles about apprentice shortage, the public would never know they existed, for the schools are not mentioned by the majority of the writers. If they do refer to them at all it is with this implication; that the training received by apprentices in a shop is always superior to the training received in a trade or vocational school.

I do not think this is fair to the school and in this article I will try to correct this impression and show from my own experience as an apprentice and teacher, that the training in the average trade and vocational school is far superior to the training received in the average shop or factory.

My case proved the well known fact that children seek employment in shops or factories near their homes. As there is no way for a beginner to know the quality of work being done, unless a parent or friend happens to know, an applicant does not always start his training in the shops where the best work is being done. Some times the shop has an apprentice system, more often it has none, and the apprentice is left in charge of a more or less intelligent foreman. My case was similar to this, for when I started to look for a place to learn a trade I did not have enough experience to discriminate between a good and bad shop. The first place on my list, the one nearest my home, needed an apprentice and as it had apparently, at least to my unskilled eyes, a tremendous amount of equipment, I bound myself to stay the required time for a very minimum wage. Of course, the foreman promised to teach me the trade, but of course I must start at the bottom.

The bottom in that shop was a lowly place indeed; in fact for a while I was an assistant to a laborer and learned to push a broom and run errands. The amount of knowledge relating to my trade that was obtained the first six months was very meager—almost nothing. This would not have been so bad, but it soon became evident to me that the foreman was familiar with only a small part of the trade and had had no technical training. He used the apprentices on the job of the moment and moved them from one job to another without any sequence or system. But for the fact that an old mechanic took an interest in me and that I attended late afternoon and evening classes at a local institute, my knowledge of the trade would be extremely limited. Having checked my apprentice experience with others, I believe that this method of apprentice training is common in all small shops and there are a great many more small than large shops. There are some large concerns that do have excellent training, but even in these, except for the few that have trained teachers, we run against the same limitation in the foreman who is generally the instructor.

How far superior is the training received in school. For half a day the student is in the shop following a prepared course with an educational sequence. He spends a proportional amount of his time on every machine and process after it has been explained to him by the teacher. Where the average foreman can't be bothered, the teacher answers questions and gives shop talks with explanations of each process.

The average instructor is better qualified to teach than the average foreman; particularly is this true in the larger cities where competitive examinations are held for all

teaching positions. To qualify in this city, a shop teacher must have had at least five years' journeyman, or executive experience in the trade he wishes to teach. Then he must pass with an average above 70 per cent, a written, practical, teaching and oral test before he is granted a license.

Besides the training received in shop, the student is given a good academic training generally correlated with his shopwork, or based on his shop problems. He learns to draw and how to figure his job. In science he learns the purpose and the use, with any chemistry connected with the problem. He learns how to express himself in English and how to write business forms and contracts. The history of his trade is taught in the history class.

From the training he has received, he is able, after some journeyman experience, to qualify for a foreman and superintendent's position, and he is not liable to be a one-job man like so many shop apprentices.

GUIDANCE ACTIVITIES OF AMERICAN COLLEGES AND UNIVERSITIES.

H. E. Stone. Dean of Men, West Virginia University.

1. Brown University has been a leader in the guidance of undergraduates through orientation lectures.

2. Distinctive work has been done at Carnegie Institute of Technology in the examination of students who are looking forward to engineering careers.

3. Ohio State University has a committee on vocational guidance for the dissemination of information on occupations open to women.

4. The University of Washington has a vocational secretary with four full time assistants, one outside agent, and extra special help when needed.

5. For several years the University of Montana has given freshmen a course of lectures called "college education."

6. An annual conference on vocational information is held at the University of Wisconsin. Literature on vocational opportunities is assembled.

7. Leland Stanford University and Oberlin College have prepared interesting and valuable booklets on occupations.

8. Dartmouth College has a vocational counselor.

9. There is a bureau of vocational guidance in the Graduate School of Education, of Harvard University. Freshmen are assisted by under-graduate advisers.

10. Northwestern University employs a director of personnel in whose office are kept very complete personnel records.

11. Columbia University and the University of Chicago offer courses for the training of workers in vocational guidance.

12. Helpful pamphlets giving educational and occupational guidance have been issued by the National Research Council in Washington.

13. The Graduate School of the University of Iowa has issued helpful pamphlets relating to guidance.

14. Yale University now maintains a single freshman class undifferentiated as to the future intentions of students.

15. A personnel record blank is being used with West Virginia University students for purposes of educational, vocational, and personal guidance. Freshman tests were given for the first time this year. A dean of men was added to the staff of administrative officers.

Toy Transformer

Lee M. Klinefelter, Electrical Instructor, Ruffner Junior High School, Norfolk, Va.

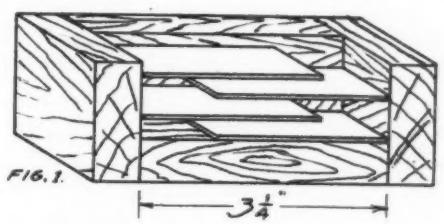
THIS little transformer is an interesting and instructive problem for boys of high school or junior high school age. It involves only tools that are likely to be found in any school shop, and materials that can be obtained almost anywhere. It supplies sufficient current for operating small toy motors, electric trains, low voltage lights, etc., and gives a boy an insight into the principles which govern the construction and operation of transformers.

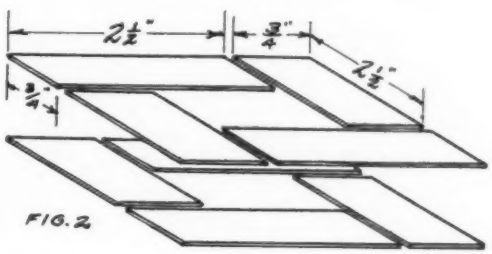
For the core, about 2½ pounds of No. 24 guage black iron will be needed. This is cut into laminations ¾" by 2½", and there should be enough to make four stacks, each one inch thick when compressed. The exact guage of the iron is not important, although the thinner it is, the better, but only black iron should be used. The use of galvanized or tinned iron in the core would not only mean the reduction of the amount of iron in it, but would cause increased iron losses. If No. 24 iron is used, about 65 pieces will be required for each one inch stack, or a total of about 260. These can be cut up with the tin snips or if a sheet metal shop is at hand they can be much more quickly and evenly cut on the squaring shears.

After the laminations are cut, a three sided box on the order of that shown in Fig. 1 should be made. This box should be 3¼" long, and about an inch deep and 1-¼" high, all inside measurements. Take enough laminations to make a 1" pile when compressed and stack them in this box, placing the first one to one end, the second one to the other end, and so on, as shown in Fig. 1. When the stack is completed remove it carefully and tape the center 1-½" with friction tape, compressing it as tightly as possible while doing so. Now make and tape another stack in exactly the same way.

Take two pieces of very heavy cardboard about two inches square and lay off a rectangle ¾" by 1" in the center of each. Draw the diagonals of these rectangles, and with a knife cut along these diagonals. Turn back the points thus formed and slip these two pieces over the ends of one of the cores as shown in Fig. 3. They should be about 1-½" apart. A piece of wire or strong cord can be twisted tightly around the turned back points to keep these cardboard ends in place. Now tear off a number of pieces of friction tape about 4" long and lay them lengthwise of the core, slightly overlapping each other, and hanging over the cardboard ends, as shown in Fig. 3.

The primary winding should consist of about 1100 turns of insulated wire, No. 30 or 32, B. & S. The exact size is not important in a small transformer of this kind,





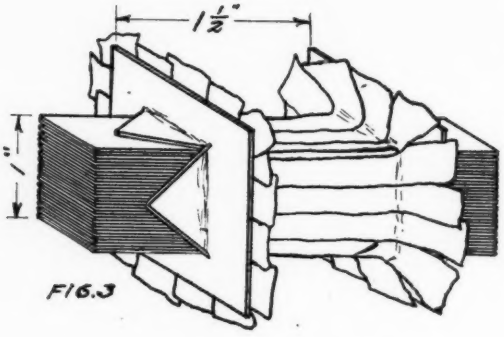


FIG. 3

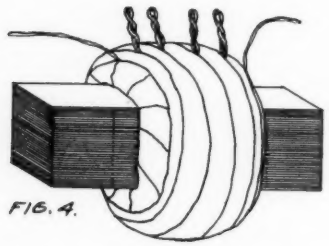


FIG. 4.

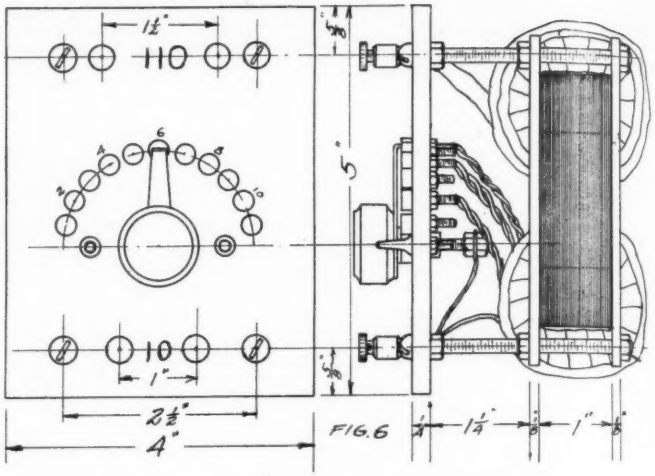


FIG. 6

nor is the kind of insulation, cotton, silk and enamel all being satisfactory. Often a boy will have an old coil of some kind from which he can obtain wire for this purpose. No attempt at winding in layers need be made if the insulation on the wire is good, as the large number of turns would make this extremly tiresome. If the winding is kept reasonably even as it is put on, the voltage between any two turns that are likely to come together will be very small. However, if the insulation is not good it may be necessary to wind in layers and put a piece of paper between layers. Before beginning to wind, punch a hole through the cardboard at one end and bring out about six inches of wire. After the winding is completed, bring out the same amount of the other end and cut off. Then bring the loose ends of tape over onto the coil from both ends. They should be long enough to overlap a little. You can now slip off the cardboard ends, wrap a few turns of tape around the coil to hold down the loose ends of tape and give a neat appearance, and the primary coil will be complete.

The number of turns on the secondary will depend on the voltage desired. For most purposes a winding to give 2, 4, 6, 8 and 10 volts is satisfactory. If we suppose that the transformer will be used on 110 volt supply, the 1100 turn primary will have 10 turns per volt. On account of magnetic leakage and the internal resistance drop, it will be well to allow 11 turns per volt on the secondary. Thus, if we want the above voltages, taps should be taken out at 22, 44, 66, 88 and 110 turns. This coil is wound the same as the primary but No. 18 or No. 20 wire should be used. The taps are brought out by twisting about eight inches of wire into a loop, and the completed coil will look somewhat like Fig. 4.

This method of winding coils directly on the core, while not followed in general practice, is entirely satisfactory in a small transformer of this kind, and not only gives a compact transformer but makes winding forms unnecessary. The friction tape insulation also is not standard practise, but it can be easily obtained anywhere and does very well.

You are now ready to assemble the transformer. Stand the two cores with their windings on end with the laminations edge to edge and about 1-¾" apart. Then fill in the ends with the remaining two piles of laminations. This is done by slipping the end of the first lamination between the ends of the first two laminations of the primary core, the second between the first two of the secondary core, and so on, one end of each lamination being between the ends of two core laminations and the other end butting against the edge of a lamination in the other core. This is kept up until the ends are filled up solid. Fig. 2 shows the position of laminations in two adjoining layers.

The transformer should now be clamped up to hold it together and to prevent humming. A very good plan is to mount it on a slate panel as shown in Fig. 5 and Fig. 6. There can usually be found a broken piece of blackboard slate around any school, and this makes very good panel material. It can be easily cut to size with a hack saw and drills readily. Fig. 6 shows a very satisfactory layout, using a tap-switch such as is commonly used on radio sets. It will be noticed that an extra switch point is placed between each pair of taps. This makes it impossible to short circuit the secondary coils in switching from one to another.

The clamping strips should be about ⅛" by 1" by about 4¼" long strap iron or brass, and the long machine screws are 3/16" by 3". All the dimensions given are of course suggestive, and may be altered to suit material at hand.

If the transformer is to be made for use as a bell ringing transformer and to be connected continuously across the alternating current supply, it will be well to use smaller wire, say No. 36 for the primary, and double the number of turns. This will reduce the possible output somewhat, but it will also reduce the noload input to practically nothing, or at least to such a small amount as to be hardly noticeable on the monthly light bill. If this is done, putting say, 2000 turns on the primary, 100 turns on the secondary will give about five volts. This should be enough for any bell circuit that ordinarily operates on not more than three or four dry cells.

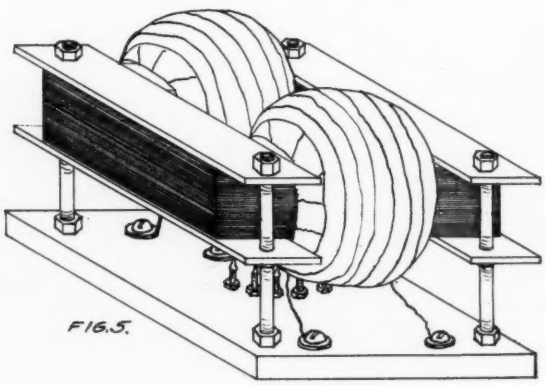


FIG. 5.

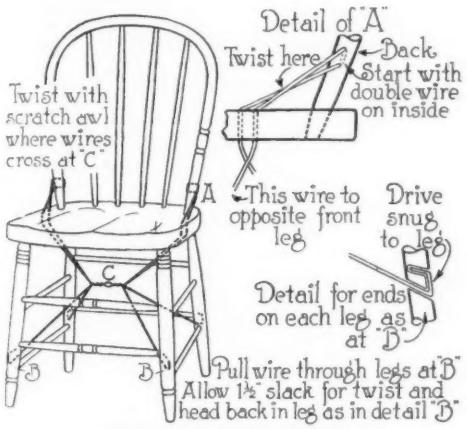
No box is shown in the sketches, but the transformer may very well be enclosed in a sheet metal or wooden box. If a wooden box is used it should be lined on the inside with sheet asbestos or asbestos paper.

A CHAIR REPAIRING PROJECT.

E. Perry Van Leuven, Hyrum, Utah.

The course in farm mechanics in the South Cache high school includes a broad series of projects in caring for farm machinery and equipment and a number of projects related to home equipment and furniture.

During a week at the beginning of the second semester, the time of the class was devoted to the repair of chairs. The class wired and repaired 156 chairs brought in from the community, and a number of chairs belonging to the school system. The number of school chairs was limited because we had wired them during the previous school year.


Detail of "A"
Twist here
Back
Start with double wire on inside
Twist with scratch awl where wires cross at "C"
A
This wire to opposite front leg
Drive snug to leg
Detail for ends on each leg as at "B"
B
B
Pull wire through legs at "B"
Allow 1½" slack for twist and head back in leg as in detail "B"

DETAILS OF CHAIR WIRING.

Practically each boy was furnished two chairs to wire and in addition was required to repair and wire at least one chair at home. Not all boys were furnished with two chairs in school but many of the boys wired from six to twelve chairs at home. One boy wired eighteen chairs on Saturdays for neighbors, at ten cents each.

The type of wiring used is illustrated in the accompanying drawing. It was developed in the South Cache high school and from experience on about 500 chairs which have been in use three or four years, has been found better than the usual type.

The directions for the wiring may be summarized in brief as follows:

Drill holes with small drill slightly larger than wire. Double holes should be one-half inch apart. With string measure for the length of the wire needed. Fold the wire sharply at the center and insert the ends in the bow (from inside towards outside). Cross the wires and insert in the legs on the opposite side. Pull the wires tight. Allow three inches, 1½" for slack to twist and 1½" to clinch in leg.

Drive the end-head formed snug to the leg. Twist with an awl between the pair of wires to the rear legs and the pair to the front legs. (All together). Twist above the seat at A.

INSTRUCTION SHEET FOR WOOD WORKING.

As a means of systematizing the work in the elementary wood working shops and of eliminating the repetition of fundamental instructions, Mr. Daniel Darney, Director of Manual Arts at Leominster, Mass., has worked out the following instruction sheet. Each boy is supplied with a copy and is expected to understand the sequence of operations. The sheets have been used with good success and have been instrumental in developing an easier way of solving problems.

Think Think Think Think Think

DIRECTIONS FOR DEVELOPING YOUR PROJECT.

Follow these directions carefully. No credit will be given for a different order of steps.

1st. Study your working drawing and see how the different pieces are related. Note construction. Names of the different joints.

2nd. Make a stock list.

3rd. Get out stock quickly from stock list. Allow about ⅛" for finishing to size.

4th. True up *each piece separately to size.* Shape the curved pieces. *Mark all of the way around before cutting. Check the sizes of each piece from the drawing. Check the shapes.*

5th. Locate all screw, brad or nail holes with very light pencil lines crossed at right-angles.

6th. Mark the exact spot for the center of the hole with an awl or point of a brad.

7th. Erase all pencil lines.

8th. Sandpaper all the pieces as white as possible. Use a sandpaper block on all broad surfaces.

9th. Bore all holes for screws, etc. The hole through the top piece of wood should be large enough to allow the screw to slip through the entire distance up to the under side of the head of the screw. Bore a shallow hole into the second piece of stock.

10th. Assemble the various pieces. *Check every joint to see that it is the right angle and tight.* Correct. A little oil or soap on the screw will make the driving easier.

11th. Apply finish. Stain, paint, etc. Wipe the stain off if you wish a light value.

12th. When the stain is completely dry the object may be varnished, waxed, or shellacked. This should not be done the same day as the stain has been applied.

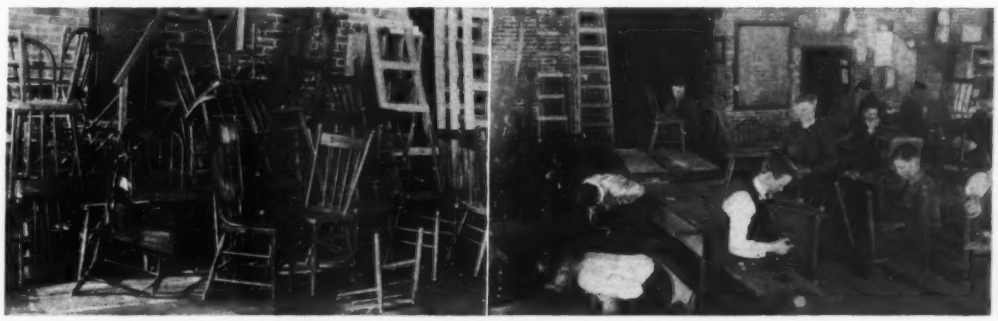
After each one of the above steps has been completed show the work to your teacher for inspection and checking.

All material destroyed through carelessness by a boy should be paid for by that boy.

Always tie your work together with a piece of string before putting it in your locker. Write your name neatly on the end or bottom of each piece of stock.

Price to the maker of a model is the cost of the material.

Think Think Think Think Think



SOME OF THE CHAIRS AND THE CLASS AT WORK.

PROBLEMS AND PROJECTS

The Department of Problems and Projects aims to present each month a wide variety of class and shop projects in the Industrial Arts. Successful problems are invited and will be paid for. A brief description of constructed problems, not exceeding 250 words in length, should be accompanied by a good working drawing. The originals of the problems in drawing and design should be sent.

Problems in benchwork, machine shop practice, turning, patternmaking, sewing, millinery, forging, cooking, jewelry, bookbinding, basketry, pottery, leather work, cement work, foundry work, and other lines of industrial-arts work are desired for consideration. The editors will not accept the old hackneyed problems of footstools, taborets, towel holders, etc., which have been made from time immemorial, ad nauseum.

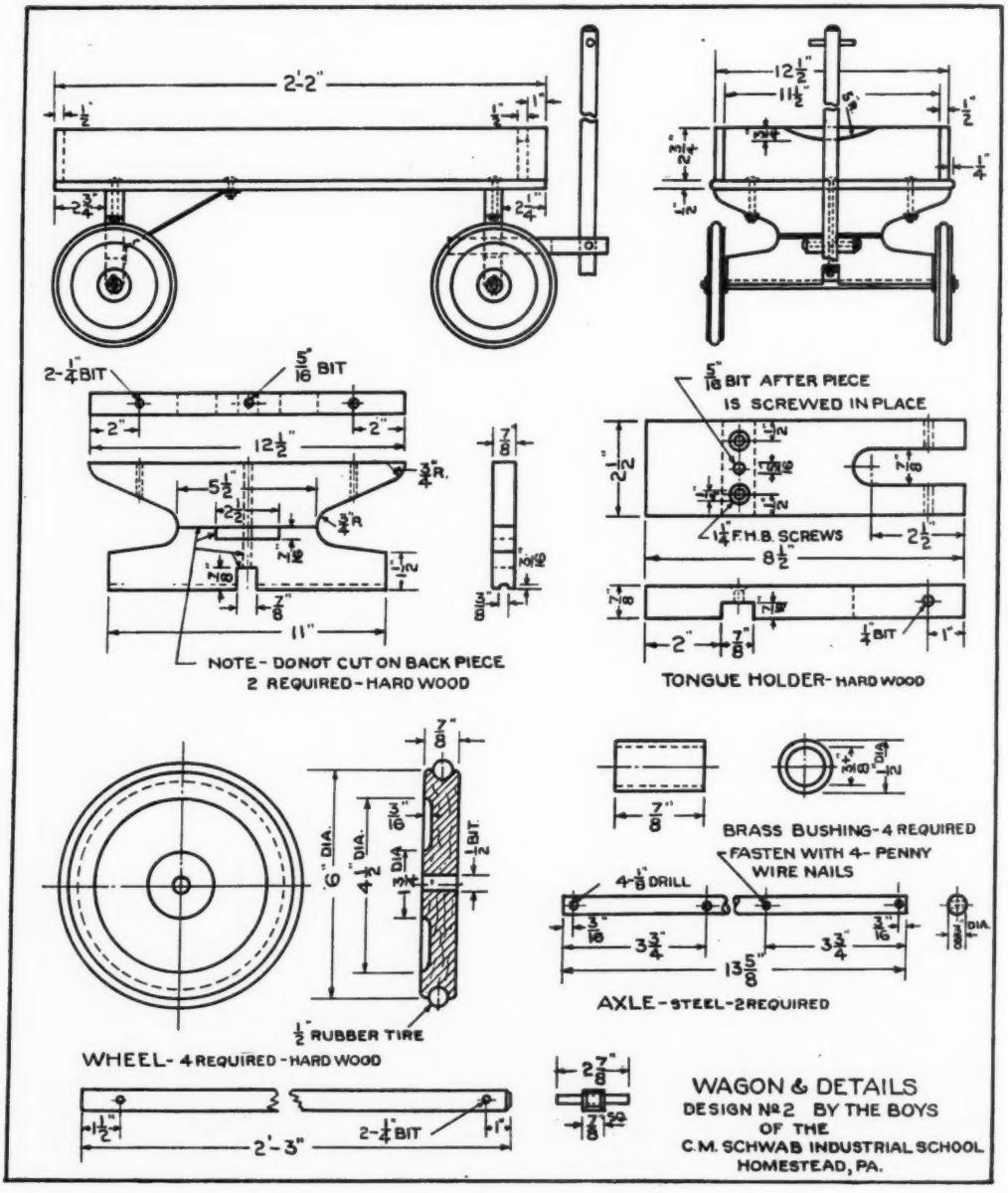
Drawings and manuscripts should be addressed: The Editors, INDUSTRIAL-ARTS MAGAZINE, Milwaukee, Wis.

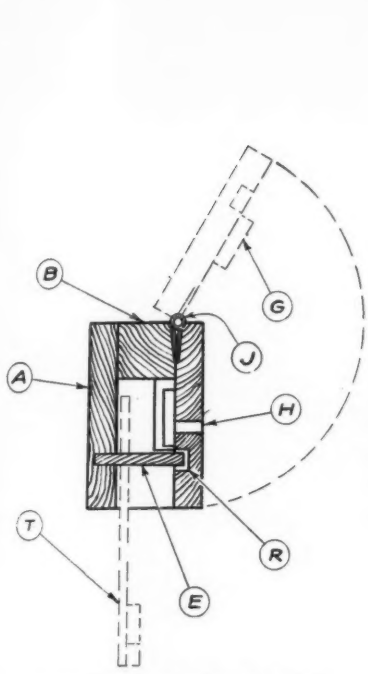
THE EVOLUTION OF A WAGON.

A Mechanical Drawing Project.

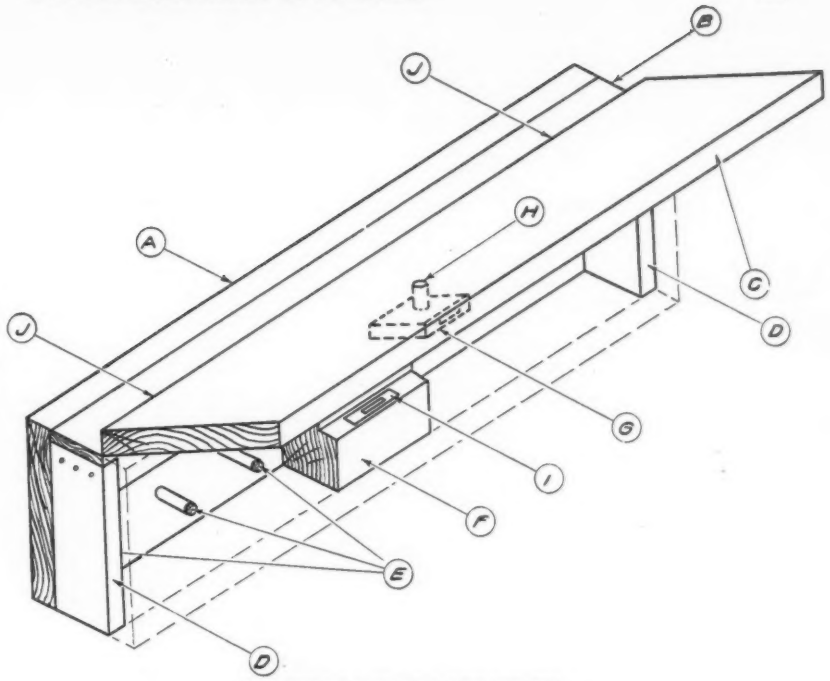
C. F. Wintersteen, Homestead, Pa.

Some years ago the writer was called upon to teach a class of so-called special prevocational boys in mechanical drawing. Their schedule called for two full hour-periods, twice a week for the term. As the boys were getting considerable turning and benchwork it devolved on the drawing teacher to work out something vitally interesting to the class. After much thought on the problem the instructor finally hit on the idea of taking a kiddie kar to school and letting the boys pass it around to sketch a part at a time. The boys became interested to the extent that the sketches were taken to the shop where a second model was made. With one or two exceptions the parts were all drawn full size on standard paper 11"x15". Since tracing paper develops just as good a blueprint at a fraction of the cost of tracing cloth, the cost of material


2'-2"
2-¼" BIT
5/16" BIT
NOTE - DO NOT CUT ON BACK PIECE
2 REQUIRED - HARD WOOD
5/16" BIT AFTER PIECE IS SCREWED IN PLACE
1¼" F.H.B. SCREWS
TONGUE HOLDER - HARD WOOD
BRASS BUSHING - 4 REQUIRED
FASTEN WITH 4- PENNY WIRE NAILS
4-⅛" DRILL
AXLE - STEEL - 2 REQUIRED
½" RUBBER TIRE
WHEEL - 4 REQUIRED - HARD WOOD
2'-3"
WAGON & DETAILS
DESIGN Nº 2 BY THE BOYS OF THE C.M. SCHWAB INDUSTRIAL SCHOOL HOMESTEAD, PA.



SECTION OF TEE SQUARE LOCKER.



DETAILS OF A TEE SQUARE LOCKER.

involved was negligible. It is needless to say the boys were enthusiastic in developing the blueprints. In order to have everything complete the screws, washers, and screw tables were drawn on a separate sheet. All told there were eight drawings. Taking these and making an assembly drawing afforded a good deal of interest. Our files contain the tracings. A number of these cars were turned out last year in our elementary pattern-making course to give some variety to the work.

The following year many of the boys just mentioned decided to take the unit-trade pattern and machine course. The thought occurred to the instructor that if the boys could copy a project they could design one. Accordingly the matter was talked over and it was decided to design a wagon. Everything considered, the project appeared modest enough, one that could be carried to a definite conclusion. Several of the boys with initiative and stick-to-itiveness were instructed how to proceed with the layout. After several minor changes, and in due time, the layout was labelled satisfactory.

In much the same manner as in a drawing room, the designers with the aid of the instructor, assigned parts to the other members of the class to detail. Before the drawings, tracings, blueprints, and assembly were completed every member of the class had taken some part of the project. As with the kiddie kar the book of blueprints was taken to the shop where several wagons were made. The writer's children have been using one a number of years and it has been given rough treatment. The drawings for this wagon appeared in the June, 1918 number of this magazine.

But designs in the industries are a matter of evolution. Not to be outdone by competition, and after experimentation, several improvements were deemed necessary. The screw fastenings for the wheels were found to be a source of weakness when the wagon was overloaded. In the 1922 model this weakness has been corrected. Steel axles, brass sleeve bearings, and rubber tires have been added. Our designers have had something to work from. The first design formed the basis for a modern and stronger product.

In conclusion, the design submitted for publication has been carried along with our regular drawing room work. The evolution has taken several years. It has given the boys practical experiences which parallel the experiences that obtain in the industries. Though our drawing course is a related trade subject the wagon has slowly developed into a high grade toy with all the details carefully considered. Several of these wagons have been made and they are satisfactory.

Hardware.

1 5/16"x5" Wagon bolt.
4 ¼"x2¼" Wagon bolt.
1 ¼"x3" Wagon bolt.
10 ⅜" Washers.
1 ¼"x1" Round head stove bolt.
6 ¼" Washers.
4 3/32" Cotter pins.
4 4-penny Wire nails.

The brass tubing we purchased from the McKenna Brass Co. of Pittsburgh at 20 cents a foot.

A TEE SQUARE LOCKER.

Charles W. Frost, St. Paul, Minn.

The use of this device solves the problem of frustrating unauthorized "borrowers," and facilitates checking up equipment at the ends of the periods.

Dimensions are not given as these vary according to the requirements of the school but the construction and method of using are clearly shown.

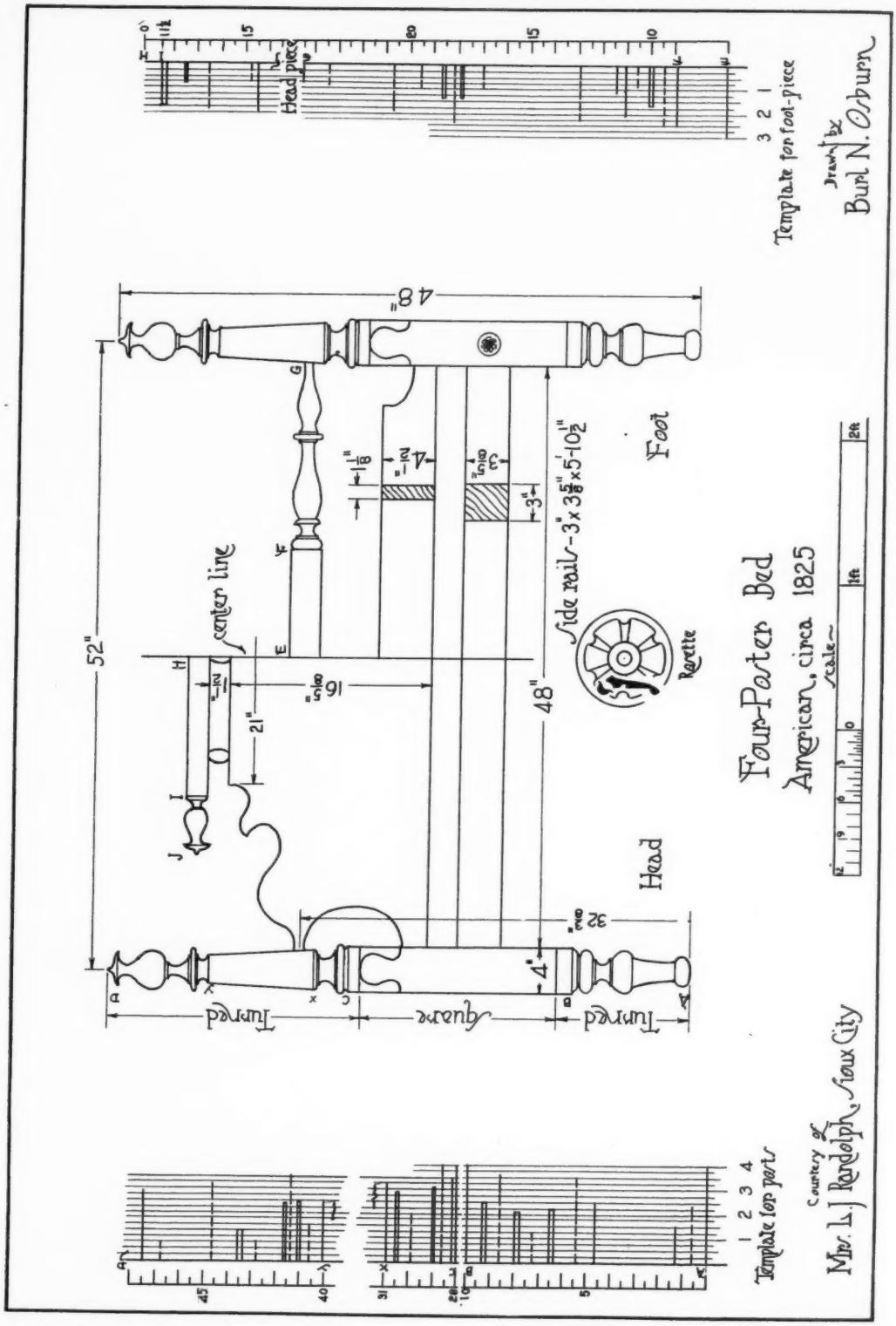
Names of Parts.

A—Backboard
B—Top board
C—Front "door"
D—End pieces
E—Dowel pins upon which squares are hung
F—Stop block
G—Lock
H—Key hole
I—Stop plate
J—Hinges
R—Recess in back of door
T—Tee Square

A CLAMP DOG.

G. H. Snaddon, Detroit, Mich.

Use ⅝" square cold rolled steel to make the clamp dog shown. Center both ends of the long jaw by drawing diagonal lines accurately across the ends. Turn the taper in the lathe to the dimensions specified. If the tailstock set-over is used, it will be found mathematically that the set-over is .275 or approximately 9/32". Next heat this jaw in the furnace and bend in the vise, using the bevel protractor for measuring the angle.



After rounding the ends, lay out and drill the short jaw. Place both the short and long jaws in the drill press vise together, and spot the holes in the long jaw. Remove the short jaw, then drill the long jaw with the tap size drill, which is 5/16".

Use a three square file, or a 90° double angle cutter on the milling machine to cut the groove in the jaws.

Assemble so that the screws turn freely. Case harden all parts before using.

FOUR POSTER BED

Burl N. Osburn, Sioux City, Ia.

The four poster bed shown here is a direct decendant of the colonial bed of the high, tester type. Construction features are clear from the drawing. It may be necessary

THE BED.

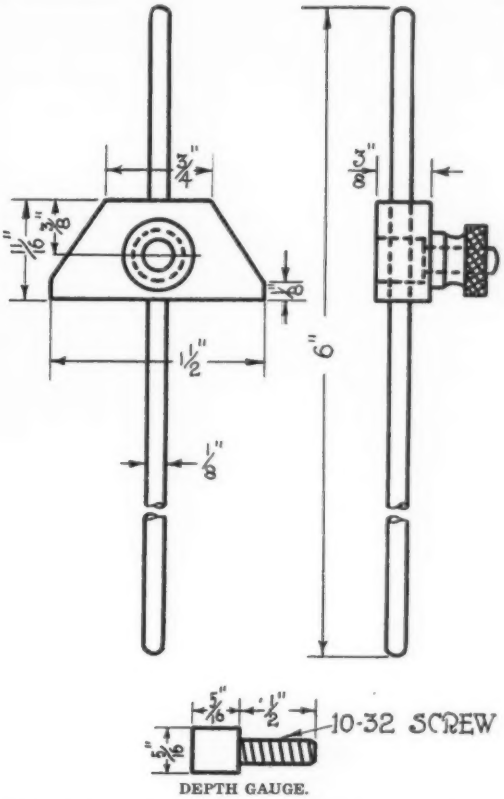
to change the construction of the side rails in order to make them conform to modern springs. The photograph shows the hand-woven "rising sun" counterpane of about the same period or a little later than that of the bed.

The drawing shows a half view of the head and foot pieces. The sizes for the turned parts may be taken from the templates at either side. The solid horizontal lines indicate the intersections of curves or beads; the dotted lines are the diameters of the turned parts at other points. The distance of any of these from the end may be taken from the scale along the side of the template. To use the template, mark off along the edge of a piece of stiff cardboard or ply-wood all the points indicated by the horizontal diameter lines. Draw these lines at right angles to the edge as long as the diameter at that point. When turning, transfer these lines to the revolving piece and set the calipers by the length of the line at the point desired.

DEPTH GAUGE.

G. G. Polson and W. W. Updegraff, Oakland, Calif.

The body of this tool is made from a piece of 3/8"x3/4" machine steel according to dimensions. The screw used to tighten the rod in place is made to fit the 5/16 inch hole drilled 3/8 inch from the end; it is then placed flush with the side of the body and the 1/8 inch hole is drilled. The 1/8 inch rod may be drill rod stock and either end hardened if desired. The thumb screw is tapped 10—32.

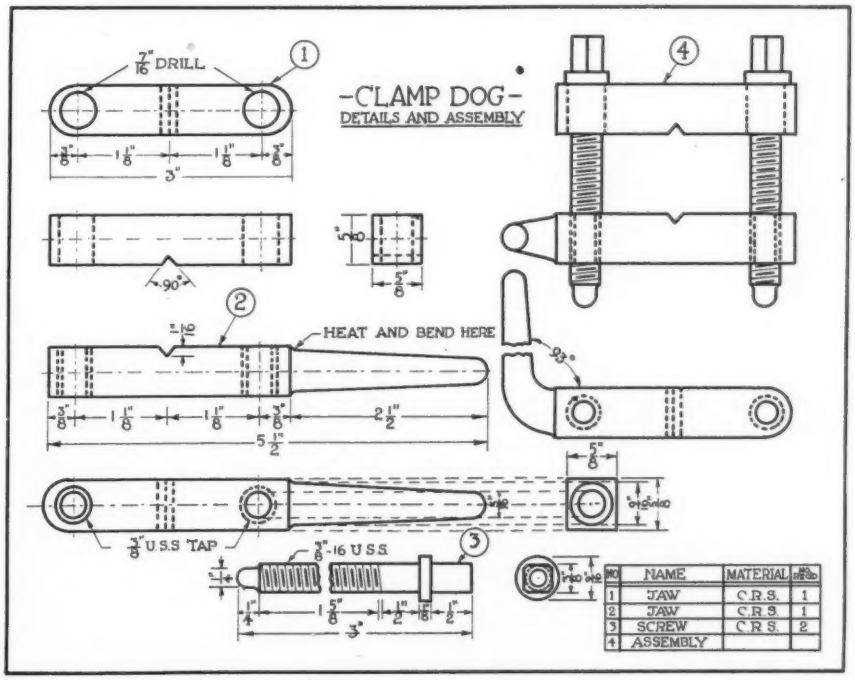


DEPTH GAUGE.

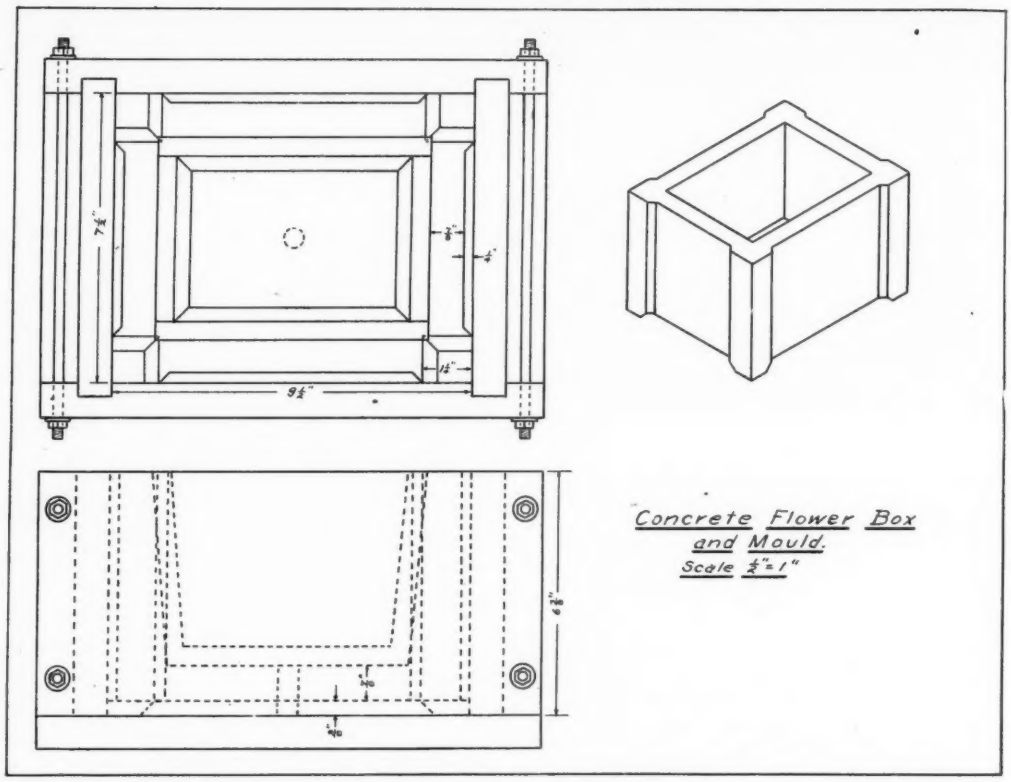
CONCRETE FLOWER BOX.

Kenneth L. McCulloch, Plainfield, N. J.

This type of concrete box has been successfully made in both seventh and eighth grades. The mould is a little more complicated than the common model with paneled



DETAILS OF A CLAMP DOG.



DETAILS OF A CONCRETE FLOWER BOX.

sides, but is not difficult to construct. By using bolts in assembling, it is very easily taken apart and with the proper care will last for several years. The core is made of either ⅜" or ½" material and has sufficient taper to permit easy removal. The entire mould is given two coats of paint and well oiled just before the concrete is placed in it.

Reinforcing is not needed if a one to two mixture is used and waterproofing compound is added to the water. If the mixture is made so that it can be well jacked without a large amount of water coming to the top, the core may be removed in three or four hours and the outer mould in four to five hours. The surface at that time will still be wet enough to permit smoothing and filling of any holes which may appear.

Coloring materials can be added to the dry mixture, and these will prevent the unsatisfactory results which sometimes are obtained when no colors are used.

The Eastern Arts Association in Convention

S. J. Vaughn

For a dozen or more years, I have been reading about the Eastern Arts Association. On May 3-5, I, a middle-westerner, for nearly twenty years a member of the Western Arts Association and once its president, slipped in on the Providence meeting to see at first hand how they do things in the East. No sooner had I arrived in Providence, than I fell bodily into the hands of the ever-present Frank E. Mathewson. This seemed accidental, but I am told that all visitors have the same experience—they meet Frank Mathewson at the station and at every turn in the road during their stay and leave him waving them adieu as they take their departure.

The greatest praise that a middle-westerner could give the convention another meeting Association would be to say that it resembled in many ways the meeting of the Western Arts Association. This is indeed the thought that came to my mind all through the meeting. I found myself saying "I feel at home; this must be the Western Arts meeting after all." Then I would have to remind myself that I had run away from the Western meeting in St. Louis.

There was the same fine enthusiasm. There were the "old timers" who had organized this great association and had stood by it through difficult years. The personnel was distinct from that of the Western "old timers" group, but the same ideals and the same sense of achievement were there. Mathewson and Rose and Reagle and Farnum and Brodhead and others whose names have been connected with every meeting since the association's beginning, were very much in evidence.

The way had been thoroughly prepared for this meeting by the ingenious and attractive publicity given it by the genial secretary in the form of news letters widely circulated over the Eastern territory.

The program in all of its phases and sections impressed me as being exceedingly strong. It presented the various aspects of arts, industrial arts, home economics and vocational education through such speakers as Walter Sargent, Theodore M. Dillaway, Miss Van Renselaer, Miss Haddow, Royal Bailey Farnum and David Snedden.

One of the outstanding addresses was that by Walter Sargent on "A Modern Program in Art Education." Mr. Sargent was gratified that art is assuming new responsibilities along with the general advancement in education. According to Mr. Sargent, art has received very great help from non-artists—groups of educators and others outside the specific field of art who have studied the methods and results of art instruction and pointed out some startling defects. He deplored the lack of effectiveness of the art instruction in the past, indicated by investigations among

adult students as to the value which their art work had been to them. Mr. Sargent pleaded for a comprehensive program that would formulate a statement of definite objectives, would lay down some general principles of method, and would work out some sort of standards by which excellence of art achievements may be ascertained.

Mr. Edward C. Emerson of Boston gave a most helpful discussion of "Shop Work Below the Junior High School" before the Industrial-Arts Section. At the same session, Mr. Richard D. Allen, director of research and guidance in the Providence schools, presented a most enlightening report on his work, using the subject, "The Use of Intelligence and Accomplishment Tests in Directing Pupils into Practical-Arts Courses in Junior and Senior High Schools."

Peculiarly fortunate was the association in its meeting place this year. Providence, with its historic spots and its many interesting institutions, made the visitors' stay most interesting indeed. The State Armory was used for the general meetings, some of the sectional meetings, and the exhibits, both educational and commercial. Through the work of the boys from the Providence Trade School, the main floor of the Armory had been divided off into uniform, attractive booths for exhibition purposes. The exhibits were large, representative of all lines of work, and of excellent quality. The numerous commercial exhibits and the generous and cordial attitude of the commercial people indicate how much the Eastern Arts Association, like the Western Association, really appreciates and depends upon the commercial interests.

One most attractive feature of the school exhibitions was the "Members' Exhibit." A considerable section was devoted to paintings, drawings, jewelry work, modeling, etc., executed by the members of the Association. This is a highly desirable feature that should be added, wherever possible, to the educational exhibits connected with art associations.

I came away from the meeting of the Eastern Arts Association with the very high respect previously held, still heightened for the enthusiasm, freedom of discussion, effective cooperation, and the high and intelligent purpose of those who formed this great organization and have guided its destinies.

The Rhode Island School of Design, Brown University, and the Public Schools of Providence seemed to vie with each other in providing features of the program, delightful entertainment, and interesting exhibits for the pleasure and benefit of the members of the Association.

In addition to the regular scheduled program, there were numerous other programs at the dinners, luncheons, and reunions which added greatly to the value of the meeting. Various clubs of the city made a point of putting on special programs for the mutual benefit of the visiting teachers and of their own members. The professional significance of the meeting was, therefore, heightened and the visit made more pleasurable by the mingling of the local talent with that of the visitors from a distance. The social side of the meeting was very delightful indeed, the thoughtfulness of the local committee being particularly happy in this respect. Following the annual banquet, the guests were entertained with music and dancing. Trips about the city, and to places of interest and historic importance, were made possible by the American Legion and other organizations.

Preceding the meeting of the Eastern Arts Association, Dr. Bawden of the U. S. Bureau of Education held a Conference on the general topic "Means of Improvement for Teachers in Service."

Providence was a most royal hostess and her people deserve the warmest praise for their cordial and generous hospitality. The great success of the meeting was largely due to the efficient president, Miss Frances H. Bacheler, and her splendid staff of helpers and the local school representatives, notably Mr. Augustus F. Rose and Mr. Frederick W. Putnam.

The officers for next year were elected as follows:

President, E. A. Reuther, Westfield, N. J.

Secretary-treasurer, Frank E. Mathewson, Jersey City, N. J.

VOCATIONAL TEACHERS OF MAINE VISIT MASSACHUSETTS AND NEW HAMPSHIRE.

During the week of May 14th the special teachers of Maine, accompanied by their superintendents and representatives from industry, visited the schools of Holyoke, Springfield, Chicopee, Worcester, Manchester and Concord.

The party of fifty was accommodated in thirteen automobiles led by Mr. W. G. Venn, Superintendent of the International Correspondence Schools. Each car had a State-of-Maine flag flying from the radiator cap and each delegate wore a badge made by the boys under the supervision of Mr. Cecil C. Farrar of the Portland high school.

As this was the first trip ever attempted and carried out by any state, a great deal of interest was aroused in every city and town through which the procession passed. Publicity was given not only to the vocational work in Maine, but to the state as well.

At Holyoke the party was entertained by the chamber of commerce and the trustees of the Vocational School, through the cooperation of Mr. M. S. Herbert, director of vocational education at Holyoke. A group picture was taken at the Vocational School on Sargeant street, where the party first assembled. Sub-divisions were made here, one group visiting the domestic science departments under the guidance of Miss Jennie E. Sculley, assistant superintendent of schools; another group inspecting the manual arts departments of the junior high schools under the guidance of superintendent of schools William R. Peck. Mr. Ganey, Director of the Continuation Schools, spent the morning in escorting a group through the continuation schools.

At noon a luncheon was served in the ballroom of the Hotel Nonotuck, presided over by M. S. Herbert. In addition to the Maine group, there were present members of the Holyoke Board of Trustees and officials of the school department.

Mr. Burridge at Springfield and Mr. Jameson at Worcester were very helpful in throwing their schools open to the visitors and in sending prints of any and all articles which they manufacture. That the men and women received many new ideas was evidenced by the number who used note books. The home economics teachers visited several additional schools at Chicopee and Manchester, where they saw new equipment and the latest developments in junior-high school courses.

Upon arriving at Concord, N. H., the party was met by Mr. Roland G. Hartwell and the Morrill school staff. Rooms were assigned in the homes of members of the Concord teachers' association. At 5:30 the Concord teachers' association held a banquet in honor of their Maine guests. Members of the State Board of Education, the city board members and trade teachers from Concord and Manchester made up a group of over three hundred. Following the banquet, the guests were entertained by the Durgin Silver Co., the Rumford Press and a visit was made to the State Historical Building.

Wednesday morning was spent in inspecting classes in the Morrill school after which a luncheon was served by the girls in the home economics department of the Concord high school. Everyone in the Maine group spoke highly of the spirit of cooperation shown by Mr. Hartwell and his staff.

One leading Maine educator writes, "We could not have been treated with more courtesy and respect. The trip was profitable to the Maine teachers for two reasons: First, the actual seeing of pupils under normal conditions, and secondly, the exhibits of work shown by the students, both being essential. Seeing work in typical New England industrial centers and towns like our own made as valuable a lesson as could be taught."

Reservations and plans for the trip were made by E. K. Jenkins, state director of vocational education, assisted by H. S. Hill, supervisor of agriculture; H. L. Pride, supervisor of trades and industries, and Harriet S. Sweetser, supervisor of home economics.

Delegates by cities and towns were: One each from Auburn, Biddeford, Lisbon Falls, Pittsfield, Saco, Springvale and the normal schools: two each from Livermore Falls, Machias, Madison, and the industries: three each from Rumford and Waterville: four each from Augusta, Skowhegan, York, and the state department; five each from Bangor and Portland.

NOW, ARE THERE ANY QUESTIONS?

This department is intended for subscribers who have problems which trouble them. The editors will reply to questions, which they feel they can answer, and to other questions they will obtain replies from competent authorities. Letters must invariably be signed with full name of inquirer. All questions are numbered in the order of their receipt. If an answer is desired by mail, a stamped envelope should be enclosed. The privilege of printing any reply is reserved. Address, Industrial-Arts Magazine, Milwaukee, Wis.

Removing Glue and Filler.

354. Q: What do you consider the best way of removing excess glue from projects after it dries?

A piece of oak is filled and finished in a light color. How can I remove the filler in order to have the wood take a darker stain?—R. F. M. .

A: In reply to your question concerning the removal of glue, I would like to call your attention to the method suggested by me in an article entitled "From Millroom to Paint Shop," published in the INDUSTRIAL ARTS MAGAZINE, June 1922. In case this is not available, wash off the glue from assembled cabinet work through the use of a fiber scrubbing brush or sponge and plenty of hot, clean water. This will save you from much hard scraping on dried glue and furthermore serves to raise any bruises or indentations, so that when the piece is sanded for the last time, it is in the best possible condition for finishing. In case the glue has dried and become hard, the hot water method again is the only one which is of much value. Sometimes in the case of very small amounts dried glue may be removed either with a bevel edge scraper or a sharp plane iron.

In refinishing filled and stained oak, the filler should be softened with varnish remover and as much as possible removed with a steel wire painter's brush such as is used to clean siding before re-painting. For removing filler, the 1½" bristle pattern is the best, the longer types being too flexible. Before staining, the piece should be immediately scraped while still soft from the varnish remover, brought down to clean, bright wood. Any unevenness of tone may be overcome by sponging on a solution of two ounces of oxalic acid crystals per quart of boiling water. Be careful to avoid getting any of this material in the mouth by spattering or otherwise since it is quite poisonous. The acid will effectually bleach the oak after being brushed on freely and when the wood is thoroughly dried should be carefully sandpapered, dusted off and refinished as desired.—**Ralph G. Waring.**

Setting Red Cedar Color.

359. Q: Some years ago, in an old issue of the Magazine, I noticed a prescription for setting the color in red cedar, but now find that my copy has been lost. Will you kindly give me the solution?—W. K. D.

A: The best treatment for cedar is to give the wood a coat of a mixture of one part each of boiled linseed oil and turpentine, or naphtha. When this is dry, it should be followed by a coat of white shellac, and two coats of varnish, rubbed dull. If a waxed finish is desired, two coats of shellac will be necessary before applying the wax.

The oil and turpentine intensify the color of the wood and prevent fading. Stain would discolor the white or sapwood, which is not usually desirable.

NEW BOOKS.

The Jolly Tinker.

By Frank M. Rich. Cloth, 139 pages, illustrated. Price $1. D. Appleton & Co., New York, N. Y.

The "jolly tinker" makes all sorts of things out of tin cans, rails, wood, paper and other cheap materials. He repairs books and shoes and he can even weave simple textiles. The book is the result of teaching boys in grades four to eight and is an excellent addition to the growing literature on toy construction.

Practical Tests for the Electrical Laboratory.

By Chesley H. Johnson and Ralph P. Earle. Cloth, 347 pages, illustrated. Price $2.50 net. D. Van Nostrand Co., New York, N. Y.

This text covers a series of 69 laboratory experiments, with standard electrical apparatus for advanced high school classes. While the use of a standard text on electrical theory and familiarity with the national code rules are presupposed, ample notes on the apparatus and the principles involved in each test are supplied to make the book far more than a laboratory manual. The experiments and tests are carefully arranged to cover the entire subject from both the theoretic and trade standpoints. At the beginning the explanation is fulsome and the aids are very complete, but as the work progresses more and more independent procedure and observation and more difficult computators are required. Attention has been given to the use of limited apparatus and the economy in materials.

Modern Shaper Practice.

W. H. Rohr. Im. leather, 12 mo. 191 pages, illustrated. Price, $3. The Practical Books Co., Indianapolis, Indiana.

This book is a surprisingly comprehensive manual on the operation of woodworking shapers. The author has a wide knowledge of an immense variety of work and working conditions and a thorough grasp of the possibilities of the shaper. He takes up in logical sequence the several essential elements of shaper construction, the methods of operation, shaping with generally used accessories, typical special methods as applied to the automobile, furniture and other industries, etc. Special chapters are devoted to knife making, and such mechanical details as bearings, knife construction, power transmission, etc.

For the teacher who has perhaps limited experience the book is invaluable because it gives not only all the teaching material he can possibly use, but also an insight into mill practice of the widest variety.

Practical Mechanics and Strength of Materials.

By C. W. Leigh. Cloth, 5x7½, 293 pages. Price, $2.25. McGraw-Hill Book Co., New York, N. Y.

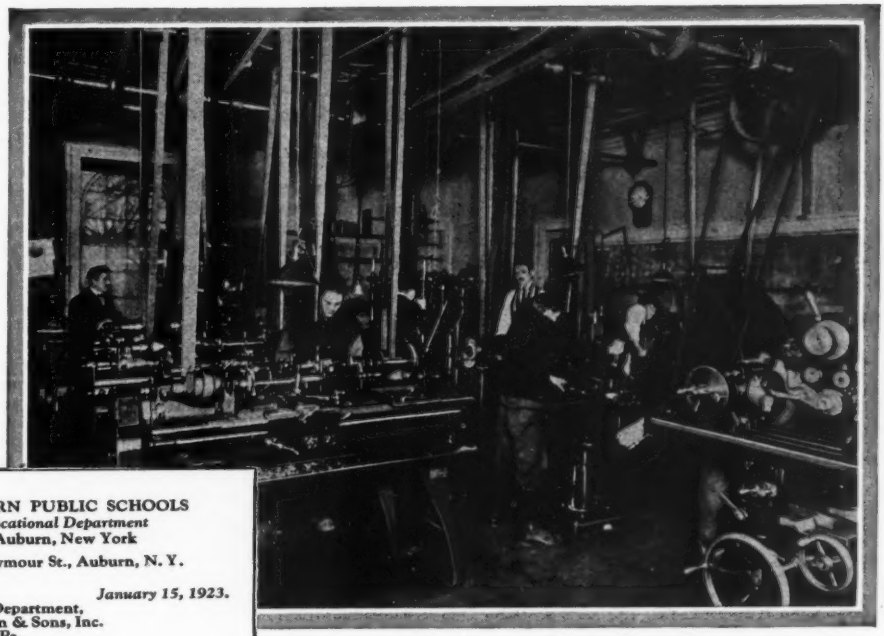
This book presents the theory of mechanics and strength of materials for practical shop men who have a fairly complete grasp of machine shop practice and who desire to understand the fundamental parts of ordinary mathematical operations and the general facts concerning materials with which they daily work.

The book has been used successfully as the basis of night courses at Armour Institute and has all the earmarks of successful classroom use. The several topics are presented in direct technical language and are well illustrated with examples taken from actual practice. A list of problems based on actual practice is appended to each chapter. The appendix of the book contains formulae and tables of practical use for the shop man.

Part-Time Cooperative Courses. Suggestions for the information of administrators interested in the organization of cooperative courses. By C. F. Klinefelter. Bulletin No. 78, September, 1922, issued by the Federal Board for Vocational Education, Washington, D. C. The bulletin which was prepared by Mr. Klinefelter as regional agent for industrial education for the Central States, is based upon the experience of the author in part-time cooperative work in Ohio, where he assisted in pioneering work, both as a coordinator and in state supervision. The specific information outlined will prove of interest to cities where it is desired to offer trade training in the schools, while providing pupils with an opportunity to complete their high-school education. The pamphlet outlines the need for cooperative courses, offers the characteristics of the courses, and suggests a typical curriculum for the use of instructors.

Course of Study in Vocational Subjects; Tool Exercises and Working Directions in Elementary Shop Work in Wood; Manual in Boys' Construction Work for Non-Platoon Schools. Prepared by several authors under the direction of the department of teacher training of the board of education, Detroit, Mich. Although the subjects are classed as vocational education, with a few exceptions, they are not vocational in the sense of preparing a student for a vocation. In preparing the outlines a careful analysis was made of the purpose and aims of the various courses. They fall under three main headings: Manual training, technical training and industrial training. An attempt has been made to furnish teachers with definite standards of accomplishment for each group of subject matter in the different courses. Suggestions are given teachers to help them in presenting the new material to their students.

Better Work



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Vocational Department
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250 Seymour St., Auburn, N. Y.

January 15, 1923.

Educational Department,
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NEWS AND NOTES.

Industrial Arts Club. The industrial arts teachers of Cincinnati have organized an industrial arts club composed of representatives of the East High School, the Hughes High School, the Woodward, and Bloom Junior High School and teachers in the several graded schools. The club has announced plans for sectional meetings in cabinet making, woodworking, metal work, mechanical drawing, and printing, to be held at the Woodward High School.

Students Construct Lathes. The students of the technical school, at Fresno, Calif., have constructed wood working lathes for the school shops. The lathes are as accurately constructed as those built by the manufacturers and are serving their purpose exceptionally well. The building of the lathes involved a wide range of activities and a variety of work so that the project offered exceptional opportunities for the boys.

School of Design Graduates Students. A class of 44 was graduated on April 24th from the Fawcett School of Industrial Arts at Newark, N. J. The graduates were students of the art department, the industrial art, costume design and mechanical drawing departments.

Wisconsin Vocational Teachers Meet. Forty vocational teachers attended the sectional conference held on April 27th at the Madison Vocational High School, Madison, Wis. Teachers from Madison, Watertown, Beloit, Janesville, Stoughton, Edgerton and LaCrosse were represented. Mr. E. E. Gunn and Mr. A. R. Graham conducted the all-day sessions. Among the economic subjects included in discussions at the conference were economics, citizenship, safety and sanitation, hygiene, industrial geography and retail selling, with related subjects including drawing, mathematics, and science as applied to the different subjects.

Report of Manual Training Activities. Mr. C. A. Kunou, supervisor of manual training at Los Angeles, Calif., has issued a report on the first semester in the manual training department. In his report, Mr. Kunou shows an enrollment of 20,254 pupils, with 1,527 classes in charge of 93 teachers. The average number of pupils to the room was 162 and the average number to the teacher was 217. The average number of classes per teacher was sixteen.

The total value of repairs and productive work carried out by the pupils in and for the schools during the period from September, 1922 to February, 1923, amounted to $921.05. The total cost for supplies for the school year amounted to $29,189.97, the average cost for that period, per pupil, reaching $1.40. The high cost for supplies is attributed to the fact that several schools other than the elementary schools, use manual training supplies.

Two Trade Schools. Trade schools for girls in Harlem and Brooklyn Boroughs, New York City, similar to the Manhattan Trade School, have been requested by representatives of welfare organizations. Application for these schools has been made to the board of superintendents and the board of education. Miss Florence Marshall, principal of the Manhattan School, declared that the school had been obliged to turn away students and that there was a large demand for the services of the students. Requests for the services of girl students were more than 400 while the average number available for positions is about 25 a month.

Industrial School Activities. Some interesting methods have been used by Mr. Raymond Hawke, director and principal of the North Braddock (Pa.) Industrial School. In September last, the superintendent of the Thompson Steel Works of North Braddock was asked to have some of the company's officials give short talks to the boys. A schedule of speakers was arranged and was followed by another group representative of workmen in the shop. The program covered a period of eight weeks and the meetings were successful both from the standpoint of the boys and from that of maintaining the interest and cooperation of the men from the mill. The schools obtained a considerable amount of supplies and equipment for the shops and an agreement was made that any graduates recommended by the principal would be employed by the Thompson company.

Another interesting method for maintaining interest and enthusiasm in the work is a vocational club, which is composed of graduates of the school and students from the advanced classes. The club provides a means of keeping in close touch with the graduates who might otherwise be lost sight of after leaving school.

(Continued on Page XXII)

The Value of Art Teaching in Public Schools

By JAMES PARTON HANEY, *Late Director of Art in the High Schools of New York City*

THE art training of the public schools should be a practical training touching closely the needs of the community; it should aim to cultivate taste and apply that taste to the homes, the dress and the business of those it trains.

A mistaken idea is to hold that art is the business only of the artist. As a matter of fact, principles of art touch every individual and are used more or less consciously by all. The housewife must decorate her home. She may use the principles of decoration well or ill, but use them she must, in the adornment of her house, in her dress, and even in the flowers which she plants in her garden or hangs in her window boxes.

The business man cannot escape from the use of art's principles for a single day. If he would "dress" a shop window, get up a circular, design a letterhead, or arrange a newspaper advertisement, he must consciously or unconsciously use the rules which art has devised in design, color and arrangement.

Art is not for "the few". It is for "the many", for the many have to use it. It is not held that the training of the public schools will produce artists, but it is held that it will raise the standards of taste throughout the community. We cannot have people with high standards without an effect on trade. People who know better things, demand better things. Thus the art teaching of the public schools has a practical relation to the business interests of every community.

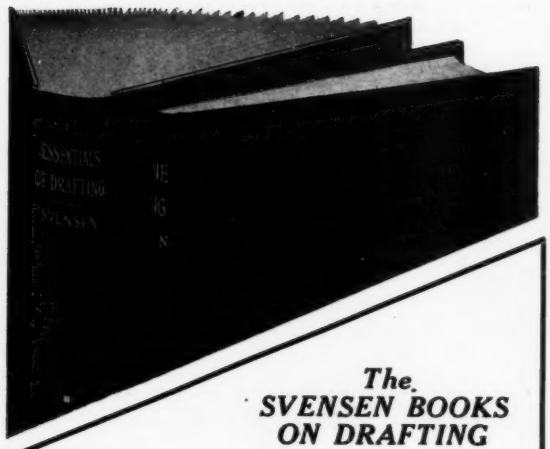
Besides this, there is a civic value in art teaching. One cannot raise standards of taste without raising standards of appreciation. The man or woman who strives to make his house better takes pride in having his town made better. Every civic "booster" knows that there is nothing which stimulates the interest and pride of citizens more than a consciousness of the growing beauty of the town in which they live.

Thus the spiritual value of art training goes with its practical value. Many of those who cannot see the spiritual worth can see the practical worth. One of the surest evidences of the broadening realization of this lies in the fact that every progressive community throughout the Union is using art training in its public schools as a means of advancing community interests. The reason is plain. One cannot change, materially, the taste of a people already grown up. To affect these standards permanently, one must begin with the children in the public schools. Art teaching is not a fad, it is an economic question with an economic reward to every community that realizes this and forwards the art work of its schools.

Reprinted from Everyday Art

THE AMERICAN CRAYON COMPANY, *Established 1835, Sandusky, Ohio, and New York*

This American Crayon advertisement appeared in The Saturday Evening Post June 2



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(Continued from Page XX)

Classes in Plastering. The Philadelphia Building Congress at Philadelphia, Pa., has announced the opening of apprenticeship classes in plastering for the education of apprentices in the trade. The classes are held in the South Philadelphia High School and are open to all apprentices who are indentured apprentices working at the trade. The classes are held on Saturday from eight to twelve M., and the employers of the apprentices pay for the time spent in attendance at these classes at the regular apprenticeship rate. Similar classes in brick-laying are planned in the near future. The course in plastering as outlined is as follows:

Shop Work: Use of tools. Mixing materials. Scratching or first coat work. Second coat work. Straightening up or lining walls; white coating; finishing plain walls. Simple ornamental work. Laying out and running work in place. Advanced ornamental work. Making coatings.

Related Work: Drawing. Plan reading. Mathematics. Estimating. Business Practice. Specifications. Lectures on materials. History of the trade. General Building Construction. Civics. English. Hygiene.

Vocational Association to St. Louis. The Vocational Education Association of the Middle West will hold its 1924 convention at the Chase Hotel, St. Louis, during the first or second week of January. Mr. J. J. Maddox, Superintendent of Schools, is general chairman of the St. Louis committee in charge of the preparations for the meeting and Mr. Lewis F. Gustafson, is vice-chairman.

Vocational Courses. New courses in vocational subjects for both boys and girls have been introduced in the high school at Lancaster, N. Y.

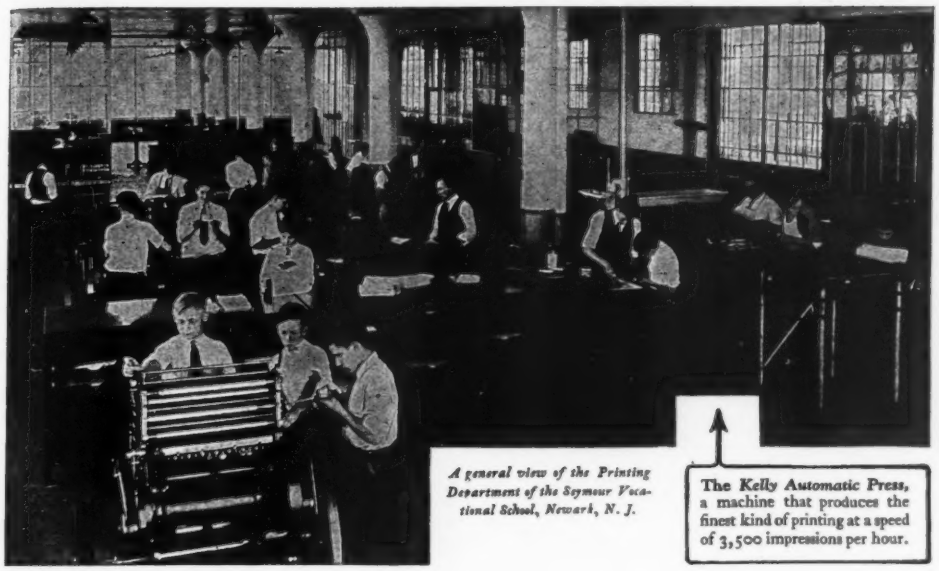
Continuation School Successful. Since the law making the continuation school compulsory went into effect, doubts have been entertained both by employers and educators as to the wisdom of the plan. The continuation school conducted in the Fremont School, at Gloversville, N. Y., although in the experimental stage, has shown good results. The hundred and eighty odd boys and girls in these classes have secured definite training along practical lines and the training is producing young people more valuable as skilled workers in the community. Classes in commercial work for boys and girls, classes in glove-making, mechanical drawing and benchwork, electric wiring and metal work are among the vocational lines offered.

In addition to the practical work, each pupil attends classes in English, arithmetic, civics and hygiene related to the trade taught. During the past summer, half of an apartment house near the school was remodeled for school purposes. After school started in September, more space was required for classrooms, finishing and storage rooms. The boys went to work in the other half of the building, tearing out partitions and getting the rooms ready for remodeling. After the plastering and heating had been completed, the boys in the electrical wiring class put in the wiring for the lights. The boys also made the necessary repairs to the windows and floors, did the painting of the walls and woodwork and completed quickly and well an interesting job.

In order that the girls of the school might learn how to improve and care for their homes, the top floor of the building was left for them to finish. The girls painted the walls and woodwork throughout, made curtains, sheets, pillow cases, table runners, towels, aprons and completely furnished the flat. With the completion of the rooms, the girls have had weekly lessons in cleaning and caring for a home. Two groups weekly plan, prepare and serve lunches. While these groups cook, others work on sewing problems, laundry work, or cleaning problems. Many of the pupils have made aprons, undergarments and the more advanced pieces such as blouses and dresses. While the time given to the work is inadequate, still it is believed that the problems offered are suggestive of the things which can be attempted in making the home more attractive.

Cooperative Trade Courses. A number of cooperative trade courses will be offered in the high school at Lebanon, Pa., in September. A total of fifteen different trades have agreed to receive apprentices. It is estimated that sixty boys will be enrolled in the new courses beginning with the fall term. A trade course in salesmanship will be offered in the high school on a similar plan. Students in this course will receive practical experience in the local business houses.

(Concluded on Page XXIV)



A general view of the Printing Department of the Seymour Vocational School, Newark, N. J.

The Kelly Automatic Press, a machine that produces the finest kind of printing at a speed of 3,500 impressions per hour.

Printing + Interest = Education

THE PRINT SHOP OF THE SEYMOUR VOCATIONAL SCHOOL, NEWARK, N. J., is not shown for the sole purpose of showing you the equipment, although you are probably interested in such equipment, but there is a greater significance in the picture. Note the interest of these future printers in their work. So great that not a boy even looked at the camera. They are printing their school paper, a beautiful twenty-four page booklet.

Boys, the sizes and ages shown, are not interested in a subject that doesn't appeal to them. Printing fascinates most boys. It teaches them the use of punctuation marks, the making of proper margins, the use of good English, correct spelling, capitalization, and indention in an accurate manner.

School Printing Outfits are inexpensive. They are designed for manual training, pre-vocational, vocational, trade, journalistic laboratory, and the four-activities-in-one-room types of instruction. The smallest school communities and all other types of schools to the the largest universities are installing printing.

Write to-day and ask for information regarding the printing outfit designed for the phase of education in which you are particularly interested. For personal attention, address it to:

F. K. PHILLIPS, *Manager*, EDUCATION DEPARTMENT

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A course in practical printing, printing teacher-training and linoleum block printing will be given at the STATE SUMMER SCHOOL, OCEAN CITY, N. J., during July. Write for information.

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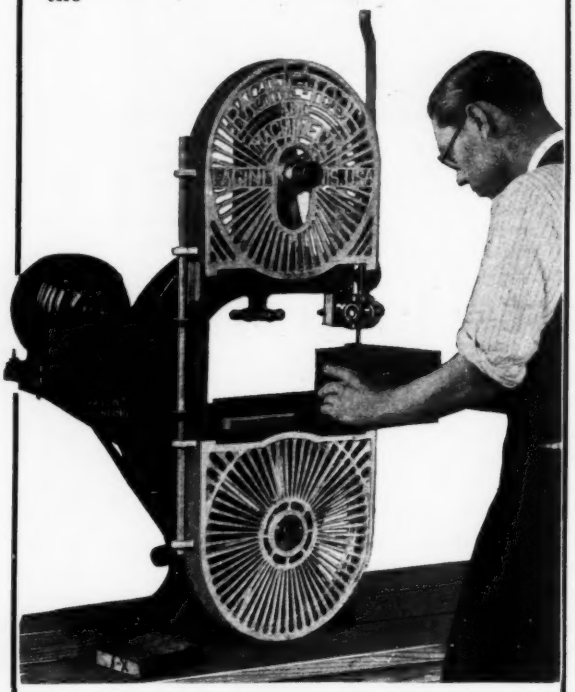
The Racine Duplex Band Saw is an inspiration to the pupils who use it. It is a practical, sturdily constructed production machine tool. The perfection of workmanship and finish, the simplicity and ease of operation beget "pride of use." And because of this fact, as well as because of the correct mechanical design, teachers find pupils do better work with the



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Use "Racine" H.S. Metal and Wood Band Saws.

RACINE TOOL & MACHINE CO.

Racine, Wisconsin, U. S. A.

Manufacturers of the famous Racine H.S. Metal Cutting Machines.

STANDARD THE WORLD OVER

(Concluded from Page XXII)

Industrial Training Conference. An intensive training conference was held at Pittsburgh, Pa., recently, under the direction of Dr. H. B. Smith, head of the department of vocational education of the University of Pittsburgh, for persons having under their charge the training classes for personnel or who look forward to such work. The conference was led by Mr. D. E. Scull of the General Electric Company at Erie.

Industrial Teachers Meet. The teachers of industrial subjects of Allegheny County, Pennsylvania, held an enjoyable dinner meeting on May 19th, at Pittsburgh. The meeting was attended by more than thirty teachers. Following the dinner, the teachers listened to an address by Mr. William Penn Lewis, State Supervisor, on the subject "Objectives for Shopwork in Junior and Senior High Schools." A permanent organization of the teachers has been formed.

Industrial Arts Bulletin. The Vocational Bureau of the State Department of Public Instruction, Harrisburg, Pa., has issued a bulletin on "Industrial Arts Education for Grades Seven, Eight and Nine." The bulletin contains an exposition of the general shop idea and serves as a guide to schoolmen in the smaller districts or in schools requiring but a single shop. The bulletin is the work of Mr. Gerald D. Whitney, who was assisted by industrial education men in the schools of the state.

Electrical Testing Apparatus. Smith-Hughes students in the high school at Williamsport, Pa., have designed and made apparatus for a new electrical testing laboratory and a number of other pieces of machinery, including a sensitive drill press, pattern maker's lathe, arbor press, centering machine and machine floor truck.

Testing Outfit for Automobile Shop. The students of the Veterans' Trade School at Williamsport, Pa., have designed and built an electrical testing outfit for use in the automobile repair shop.

Industrial Chemistry Work. The Smith-Hughes class in industrial chemistry in the high school at Williamsport, Pa., has visited practically all the local plants in which the application of chemistry may be observed.

Box Trays. Fourteen hundred box trays for the home economics department at Bethlehem, Pa., have been built by the seventh and eighth grade boys and by the carpenters of the local public trade school.

Millinery Stands. One hundred hat stands for the millinery classes were completed recently by the machinists of the Bethlehem trade school. The stands are made of cast iron. The patterns for the castings were made by freshman pattern-makers.

Graduate Five. The evening classes of Bethlehem, Pa., which closed on March 27th, held their first graduation exercises at that time. Five young men completed their courses and were given certificates.

Teacher Training. More than half of the public school teachers of Erie, Pa., were enrolled in an extension course during the school year. Twenty-two extension courses were offered during the first semester and fifteen were offered during the second semester.

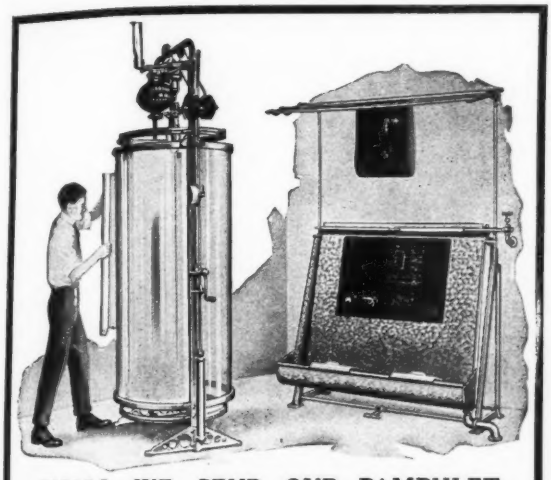
Visiting Day. Each of the five high schools at Erie, Pa., conducted day classes on different nights during the week of March 19th. Ten thousand parents and citizens took advantage of the opportunity to visit the classes and observe the work done. A number of prevocational boys, with their parents, visited the trade classes to confer with the teachers concerning the courses offered.

Industrial Arts Exhibit. The chamber of commerce at Erie, Pa., cooperated with the public schools in May, in arranging and promoting a trade, industrial arts, household arts and fine arts exhibit of the schools.

Large Enrollment. Indications point to an enrollment of more than a thousand at the Boys' Technical High School, Harrisburg, Pa., during the next year.

Design and Build Shaper. The students of the machine shop at the Boys' Technical High School, Harrisburg, Pa., have built a 9 inch shaper from drawings and castings purchased from a Cincinnati firm. The pattern shop made the patterns for the small parts.

Shop Courses. Fifteen shop teachers from the junior and senior high schools at Harrisburg, Pa., met recently for the purpose of building up courses in shopwork. Mr. Loomis, supervisor of industrial education, was leader of the conference.



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Pease Verticals are used by leading educational institutions all over the United States. In many cases they are providing an additional income to the school. Our pamphlet "How to Make Blue Prints" tells all about it and is yours for the asking.

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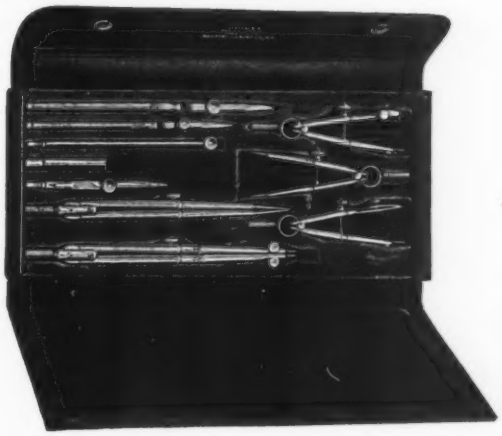

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And yet, considering their high quality, these instruments are *moderately priced.* Where the student is not able to buy the complete set at once, we are prepared to furnish the case with only the 3 essential instruments, viz., Compasses, Drawing Pen and Bow Pen, leaving the other spaces empty, thus giving the student a chance to complete the set as his means permit.

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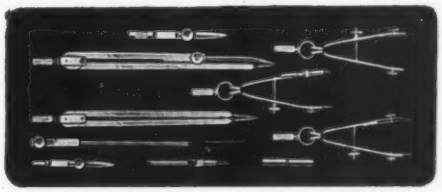
We also carry a full line of low-priced imported instruments, as well as Drawing Papers, Drawing Tables and Boards, etc.



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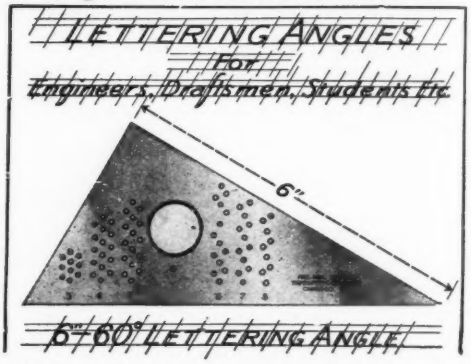

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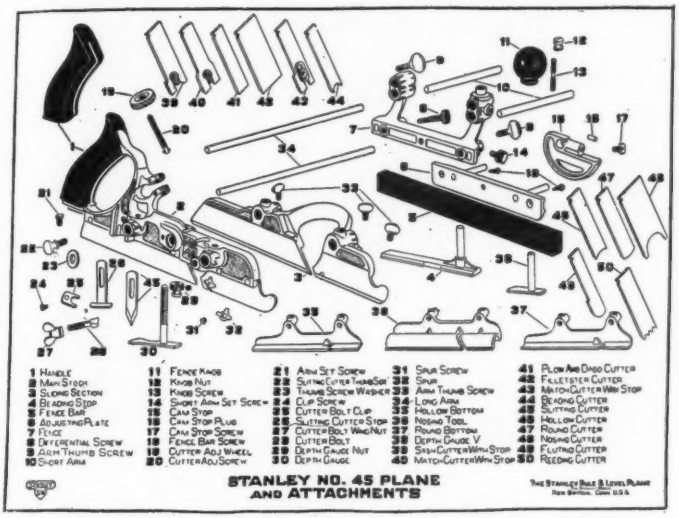

the proper method of handling various tools, and the names by which the parts of tools are known to the craft, your work will be much easier if you have the

STANLEY Complete Set of Tool Charts

The illustration shows the completeness and accuracy with which these charts have been prepared. We shall be glad to send the complete set, FREE, to any teacher of manual training requesting same.

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PROBLEMS FOR READERS.

THE DESIGN OF A LIBRARY TABLE.

The accompanying drawing is the best solution received on the problem which appeared in the May issue of the INDUSTRIAL-ARTS MAGAZINE. The drawing was submitted by Mr. W. E. Fuller, Wheeling, W. Va., who described it as follows:

The three side rails A and the splines B will give ample support for the table, so no center leg will be required. In fact, if desired, the six inner legs may be cut as indicated by dotted lines C. The load will then be carried on the six outer legs.

It will be seen that the loads on shelf ends D will be carried partly by leg E direct, and the remainder transmitted through leg F to rail G, thence to rail A. The loads on ends K will be carried partly by legs H directly, and the remainder transmitted through leg J to rail A. The entire load on rails A will be carried on legs H.

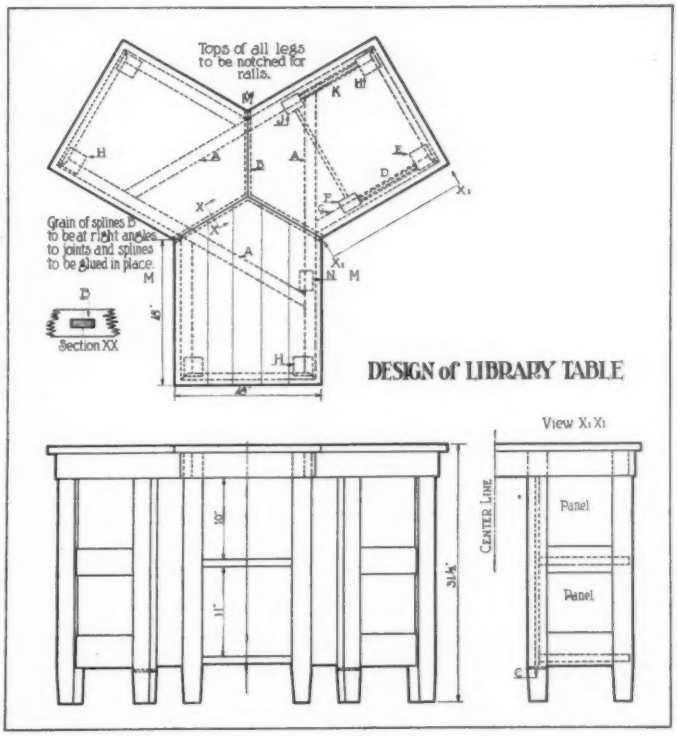
This analysis assumes that the frame be made of first class hard wood and be well jointed.

If the parties using the table are to sit in the angles M, facing the center of the table, we would suggest placing the shelves at a greater distance from the center, in order to give more room between legs F and N.

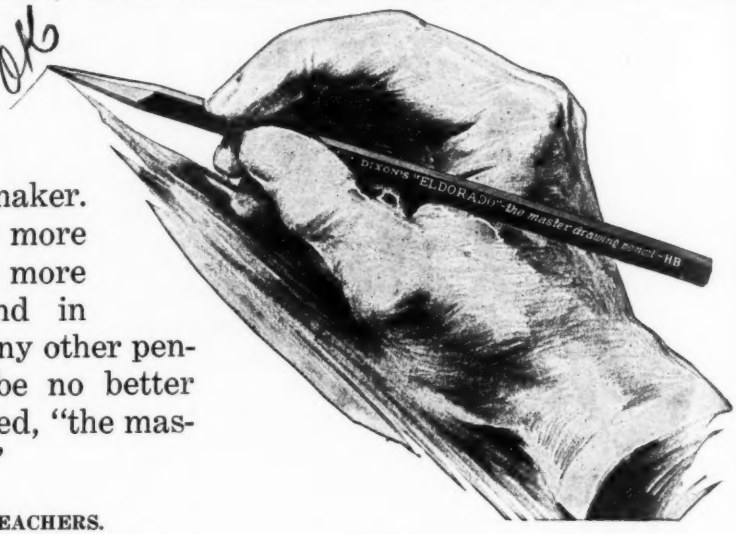
Mr. Fuller has received a check for $5.

Mr. Elmer E. Springer, of Altoona, Pa., has been appointed as instructor of related subjects in the industrial department of the Liberty High School, Bethleham, Pa.

Mr. Roland Elliott, an experienced pattern-maker, has been employed as teacher of industrial arts at the Nitschmann Junior High School, Bethlehem, Pa.


Tops of all legs to be notched for rails.
Grain of splines B to be at right angles to joints and splines to be glued in place.
Section XX
DESIGN of LIBRARY TABLE
View X1 X1
CENTER LINE
Panel
Panel

Seven years ago, the Eldorado pencil was new—untried save in the laboratory of its maker. Today it is used in more engineering offices, more drafting rooms and in more schools than any other pencil. There could be no better proof that it is, indeed, "the master drawing pencil."



SAMPLE OFFER TO TEACHERS.

Write for full-length free samples of "the master drawing pencil" and of Dixon's "BEST" Colored Pencils. In their field the "BEST" Colored Pencils hold the same position of supremacy as Dixon's Eldorado.

JOSEPH DIXON CRUCIBLE COMPANY
Pencil Dept. 128-J, Jersey City, N. J.

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BUYERS' NEWS.

Model Equipment for Domestic Science Classes. The A-B Stove Company, at Battle Creek, Mich., in the publication of its new pamphlet on "Plans of Model Installations for Domestic Science Classes" has shown a desire to give more than casual consideration to the arrangement and equipment of classrooms for this subject.

The pamphlet contains 31 pages devoted to descriptions and illustrations of typical classroom arrangements and to the firm's own product in the form of gas ranges for classroom use.

Each of the five plans shown in the pamphlet are so flexible that they may be enlarged or reduced in size to meet individual needs of classes. Five arrangements in all are described and illustrated, comprising the center group arrangement, the U-shape arrangement, the four-group arrangement, the six-group arrangement, and the three-unit type, each unit accommodating a class of 24 pupils.

The firm manufactures a number of types of gas ranges for classroom work. The model 38 range has been accepted as an ideal standard for cooking units in many schools of the country. The A-B ranges are provided with an oven heat control for regulating the heat of the ovens. They are sanitary, convenient and exceptionally efficient in use.

Information concerning these equipments may be obtained by addressing the firm at Battle Creek, Mich.

Headstock Motor Drive for Lathes. The John Steptoe Company of Cincinnati, Ohio, well known manufacturers of Shapers and Milling Machines, recently brought out a line of Medium Price Lathes, with and without quick change gear box. In order to meet the demand of a motor drive lathe, they have designed a compact motor drive arrangement which is applicable to their 14", 16", 18", and 20" lathes.

This motor drive arrangement can be readily attached to the lathes in the field as very little machine work is required with the exception of drilling and tapping a few bolt holes.

The countershaft unit is bolted right over the lathe cone pulley, and is provided with a clutch gear so that the motor can be engaged and disengaged instantly. The countershaft cone pulley can be moved away from the lathe spindle for tightening the belt. The belt from the motor to the countershaft is always kept tight by means of an idler pulley.

The motor is placed directly behind the lathe in line with the bed, and it is so placed that there is no vibration to the lathe. A constant speed motor, from 1100 to 1200 R. P. M. is recommended.

The Steptoe Standard Engine Lathe arranged for motor drive is ideally suited for repair shops, school shops, and for manufacturing establishments. The manufacturers will be pleased to send descriptive circulars of this tool as well as their other lines of machine tools.

Printing Illustrated. A series of 15 pictures illustrating the different operations in printing from the setting of the type to the operation of the press are being distributed by the Educational Department of the American Type Founders Company, Jersey City, N. J. The pictures are arranged for use in a stereoscope, bringing out clearly every detail of the work. Complete instructions are printed on the back of each card covering the operation illustrated. These sets of pictures will be sent to readers of the INDUSTRIAL ARTS MAGAZINE on request.

New Oliver Surfacers. The Oliver Machinery Company, manufacturers of woodworking machinery for shop use, has just issued a circular describing and illustrating its new Oliver No. 61 improved single surfacer. The present machine which has been improved and standardized, is equipped with ball bearings, sectional in-feed roll and sectional chip breaker. The machine meets the demand for an accurate smooth planer capable of a wide range of work in both soft and hard woods. Its special advantages are correct design, compactness, solidity, safetv features and general efficiency.

The machine is made in two widths, to plane 24 inches or 30 inches wide, and the bed receives and planes material up to eight inches thick.

Ball bearings of high grade. of the unit construction type, are used on motor-on-head surfacers. Where babbitt bearings are desired, self-oiling, side-clamping lubri-

(Concluded on Page XXX)

They have that—

"nicety of balance"
"ease of handling"

that means better work, faster work, work that satisfies your pride and proves your skill.

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please because of their appearance and satisfy because of their exceptional service.

Illustration shows ruling pen with cross-joint blade—easy to clean and quick to sharpen.

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"ARTISTA" WATER COLORS
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These two media will help in a variety of drawing needs in the shop and art room. Teachers and supervisors will be prepared to undertake problems ranging from the kindergarten through high school.

We almost forgot to say a word about LECTURERS CHALKS. A box of these colors should be within reach of every teacher who gives lessons on the blackboard.

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—start with Starrett Tools. You will find this set of Starrett Tools admirably adequate and exceptionally well suited for precision work. Contains 6 inch Combination Square Complete, Center Punch, 6 inch Flexible Steel Rule in Pocket Case, Center Gage, 4 inch Caliper, 4 inch Outside Caliper with Solid Nut, 4 inch Inside Caliper with Solid Nut, 4 inch Divider with Solid Nut.

In attractive folding leather case.

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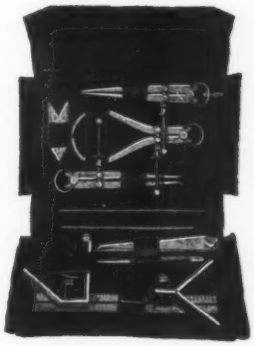

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Our Universal turns sharp edges for lock seams and round edges for wiring, also bends sheets any distance from the ends, is equipped with front and back gauges, and excells the ordinary brake in accuracy and range.

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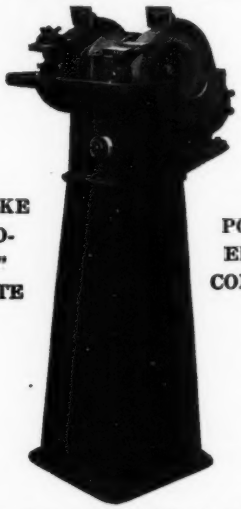
EFFICIENCY GRINDER



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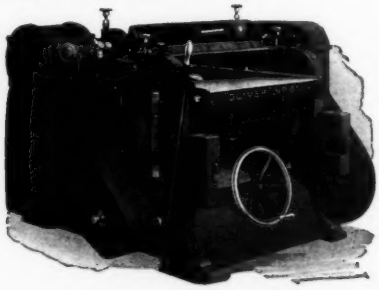
(Concluded from Page XXVIII)

cation with large oil chambers are furnished. A back pressure bar is provided for regulating the hold-down pressure on lumber as it leaves the cut. The throat has been constructed to permit of smooth planing without end clipping on very short stock.



The Oliver Company also manufactures the Oliver No. 199 single surface planer, which has a surfacing speed of 32 feet per minute. This machine which produces a very fine grade of work has a cutting diameter of 3⅞ inches, and a speed of 3600 R. P. M., giving more than ten thousand cuts per minute.

Complete information about these machines may be obtained by addressing the Oliver Machinery Company at Grand Rapids, Mich.

PERSONAL NEWS.

Mr. Ralph G. Waring of Syracuse, N. Y., will conduct a course in the use of paints, oils and varnishes at the summer session of the Oswego Normal School, at Oswego, N. Y. The course which is intended for teachers will be based on the unit lesson plan.

Mr. I. L. Williamson has been appointed State Director of Vocational Education for Utah, succeeding Francis Kirkham. Mr. Williamson assumes his new duties on July first.

Mr. Frank H. Burke, director of the continuation school at Pittsfield, Mass., has been made vice-principal of the Weaver High School at Hartford, Conn.

Mr. L. P. Whitcomb, for three years head of the vocational school at Manitowoc, Wis., has resigned.

Mr. George Wilson, organizer and promoter of the Oklahoma farmer-labor league, has been named superintendent of vocational agriculture for the state. He succeeds J. W. Bridges, who has accepted a position at the Oklahoma A. and M. College, Stillwater.

Dr. Charles W. Parmenter of the Mechanics Arts high school, Boston, Mass., was tendered a testimonial dinner in May, by the headmasters of the high schools. Dr. Parmenter retires this year having served as headmaster for twenty odd years.

W. H. Vogel, director of art in the Cincinnati, Ohio, schools was elected president of the Western Arts Association at the St. Louis, Mo., convention.

F. B. Ingels has been reappointed a member of the state board of vocational education of Oregon by Governor Walter M. Pierce. Mr. Ingels is a member of the school board at Dufur, Wasco County, a successful farmer who believes in vocational training.

Prof. Herbert Richard Cross, head of the department of fine arts in the University of Michigan, has tendered his resignation, to take effect immediately.

Miss Cora Snodgrass, supervisor of cooking and sewing at Joplin, Mo., has accepted a similar position at Elgin, Ill.

Mr. C. Heyburn Jones, an industrial chemist, has been engaged to teach industrial chemistry and related mathematics in the high school at Williamsport, Pa.

Industrial Arts Building. The corner-stone of the new home economics and manual arts building of the State Teachers' College, San Jose, Calif., was laid on March 24th with an appropriate program. State Supt. W. C. Wood made the introductory remarks at the dedication, Miss Maude I. Murchie, state supervisor of home economics, took charge of the exercises for the home economics unit, and Mr. E. R. Snyder, commissioner of vocational education for the state, had charge of the manual arts unit.

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PUBLICATIONS RECEIVED.

Elements of Working Drawings and Blue Print Reading. By A. E. Rhodes. Unit 2, of the short unit courses for evening classes and home study, conducted at Wilmington, Del. Price, 40 cents. Issued by A. E. Rhodes, Delaware Ave. and Monroe St., Wilmington, Del. This is the second of a series of short courses to be issued by the author. Many excellent problems are given for practice in both reading and making drawings, beginning with simple working drawings and ending with complete drawings for a steam engine.

Outlines of Instruction in the Needle-Working Trade. By J. V. Lynn. Price, 50 cents. Engineering Extension Department, Iowa State College, Ames, Ia. The purpose of the survey was to assist in the solution of a local problem, and it is felt that it can serve in a suggestive way to other part-time school officers with similar problems in other industries. It should be serviceable to heads of vestibule schools in the needle trade elsewhere and to plant instructors of other industries. Among the subjects covered in the work are materials used in production, construction, operation and care of machines, manufacturing costs, business turnover and analyses of certain departments.

Lane Radio. Issued by the Lane Technical High School, Chicago. A booklet describing the construction of radio receiving sets of crystal and regenerative type. The booklet outlines the theory and underlying principles of radio communication. It also describes the construction of two complete sets, one of the regenerative type, and the other of the crystal type. The booklet aims to stimulate interest in radio, and to make possible the possession of an efficient receiving set at a nominal cost.

Houses for North Dakota Birds. Bulletin No. 2, February, 1923, University of North Dakota Department Bulletin, Grand Forks, N. D. The pamphlet is intended to answer inquiries concerning the construction of bird houses. Its scope is limited to houses for North Dakota birds. The pamphlet discusses such phases of the subject as placing of bird houses, protection against enemies, structural requirements, birdhouse material and nesting material.

Standards and Problems Connected with the Issuance of Employment Certificates. Bureau Publication No. 116, 1923, issued by the Children's Bureau, United States Department of Labor, Washington, D. C. Contains the proceedings of the conference held under the auspices of the Children's Bureau and the National Education Association at Boston, Mass., on July 5, 1922. Among the topics discussed at the conference were the problems and functions of the local issuing office, the organization of an employment-certificate office, methods of enforcing standards of employment-certificate issuance, the enforcement of an age standard, the enforcement of a physical standard, and state supervision of the issuance of employment certificates.

Print Shop Yearbook, Public School No. 24, Jersey City, N. J. A print shop annual, set in type, printed on school presses and done into a book by the printing class of the school. The book is printed on good paper, with some fine examples of type, decorative lettering and color work.

First Annual Report on Industrial Rehabilitation. Bulletin No. 5, 1922, Wisconsin State Board of Vocational Education, Industrial Rehabilitation Division. The report contains a resume of the work of the Division for 1921-1922, as well as some informational material relating to both the state and federal acts pertaining to industrial rehabilitation. The material was compiled by Mr. W. F. Faulkes and Mrs. Melba R. Tippet, under the direction of the state board of vocational education.

Opportunities and Requirements in Local Occupations. Part II, 1923. Prepared by A. H. Edgerton. Issued by the board of education, Detroit, Mich. This is Part II of the series resulting from continuous investigations and analyses of the principal industrial, commercial and professional occupations in Detroit. The pamphlet comprises studies of occupations in the carpentry trades, the printing trades, nursing, social service, structural engineering, stationary engineering, and cigar making.

Punctuation for Printing Apprentices. By John F. Locke. Issued by the Printing Trade School, Cincinnati, O. A textbook for the apprentices of the printing trade school and a reference book for the graduates. The pamphlet gives the use of the principal marks such as comma, semicolon, colon, period, interrogation mark, exclamation point, dash, parenthesis, brackets and quotation marks.

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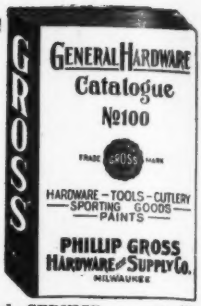

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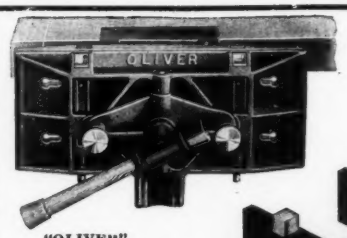

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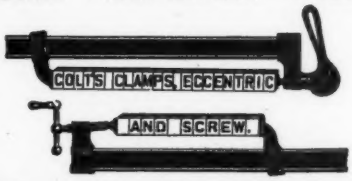

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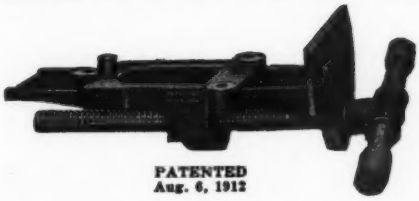

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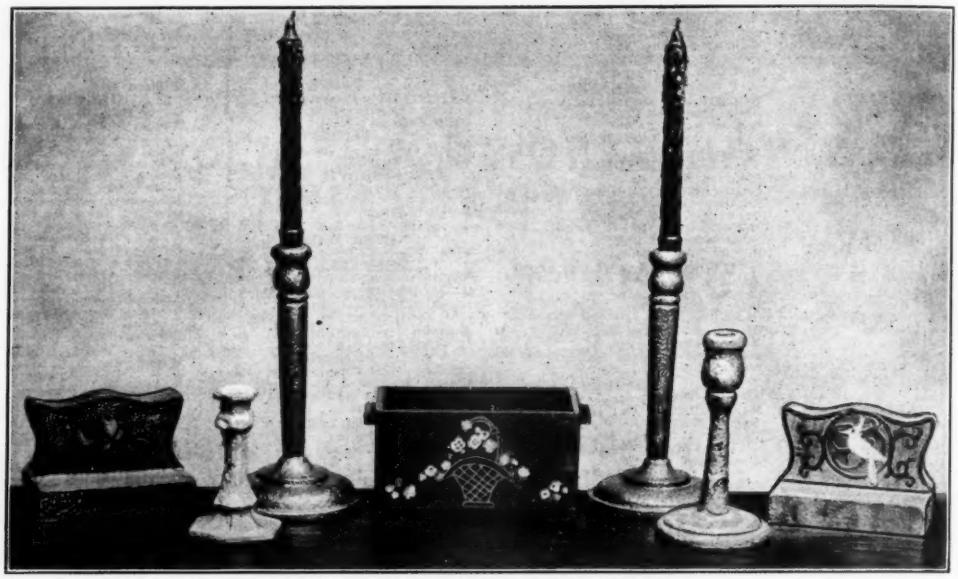

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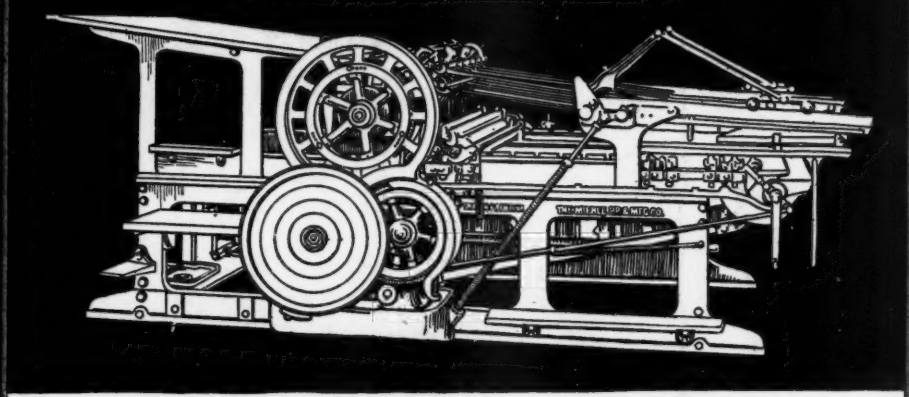

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